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DISPOSABILITY CHARACTERISTICS OF MILITARY PACKAGING MATERIALS

Booz-Allen and Hamilton, Incorporated

Prepared for
Army Natick Laboratories
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Fact Sheets on the disposability characteristics of 104 commonly used military packaging materials are presented in this report together with the methodology used in their development.

The report is divided into two parts; the first part being a brief introduction to the Fact Sheets and the Fact Sheets themselves, and the second part containing a complete description of the analysis methodology

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TECHNICAL REPORT
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DISPOSABILITY CHARACTERISTICS OF MILITARY PACKAGING MATERIALS

by

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Natick, Massachusetts 01760

FOREWORD

This report pertains to a study of the disposability characteristics of 104 military packaging materials. The work for this study was performed under Task 10, Project D552.

In the development of the recommended disposal technique for the military packaging materials, it was necessary to define their disposal characteristics, to review available disposal processes, and to develop and employ an analysis methodology that utilized a standard set of evaluation criteria. The results of the analysis were presented on standardized fact sheets.

During this study, a wide range of related literature was collected and reviewed. A complete list of this literature is included in the Selected Bibliography, Appendix E. Previous work that especially influenced the content of this report included the following:

- The Role of Packaging in Solid Waste Management, 1966 to 1976, Arsen Darney and William E. Franklin (of Midwest Research Institute), for the U.S. Department of Health, Education, and Welfare, Bureau of Solid Waste Management, Contract No. PH 88-67-114, Publication SW-5C, 1969.

- Solid Waste Management of Plastics, Arthur J. Warner, Charles H. Parker, and Bernard Baum (of Debelle & Richardson, Inc.) for the Manufacturing Chemists Association, Project 1440.2, December 1970.

- Handbook of Chemistry and Physics, Charles D. Hodgman, Chemical Rubber Publishing Company, Ohio, 35th Edition, 1954.

This project was carried out by Booz, Allen & Hamilton Inc. The principal investigators were Mr. Stephen J. Yurasits and Mr. Kunj Behari of Booz, Allen Applied Research in Bethesda, Maryland, and Mr. Duncan P. MacArthur of Foster D. Snell, Inc., in Cleveland. Project Officer for the U.S. Army Natick Laboratories was Mr. Jesse D. Hill, and the Alternate Project Officer was Mr. Raymond T. Mansur, both of the Packaging Division, General Equipment and Packaging Laboratory.

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ABSTRACT

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The report is divided into two parts; the first part being a brief introduction to the Fact Sheets and the Fact Sheets themselves, and the second part containing a complete description of the analysis methodology.

The methodology is described in detail to show how packaging materials were selected for analysis; how the materials were categorized; the general disposability characteristics of each category; the applicable waste management methods; and the detailed sequence that was followed during the analysis to finally determine the disposability of each material by each applicable waste disposal process. The methodology therefore reveals an approach that can be used in the future as new packaging materials are introduced and require analysis.

I. INTRODUCTION

This study was conducted to determine the best disposal methods to be used for individual military packaging materials. The results of the detailed paper analysis were described on an individual summary Fact Sheet for each of the 104 military packaging materials considered. The Fact Sheets were prepared to be useful references for military installations and to offer guidance in the selection of environmentally and economically sound treatment and reclamation or disposal processes.

A detailed technical discussion of the overall approach that led to completion of the summary Fact Sheets was also prepared for use by Natick Laboratories as a reference for possible future analyses. This analysis approach employed the following basic steps:

- A list of 104 materials was prepared in close coordination with Natick Laboratories. The material categories included chemicals,* glasses, metals, papers, plastics, textiles, and woods.

- The disposability characteristics of packaging materials were defined for each available process.

- The alternative processes available for the disposal of packaging materials were reviewed. The possible disposal alternatives included reuse, recycling, pyrolysis, composting, baling, incineration, sanitary landfill, sea disposal, and subjecting to microbial treatment.

- A comprehensive review of current related literature was made and related manufacturers and trade associations were contacted to examine the present disposal technology

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* The term "chemical" is being used throughout this report to denote liquid materials such as lubricants, cleaning fluids, and preservatives at the express request of Natick Laboratories.

and to identify related studies that have been conducted in the disposal of waste materials.

- The alternative solid and chemical waste disposal processes were logically arranged to display the sequence in which they could be used.

- The Summary Fact Sheet format for solid materials and for chemical materials was finalized to permit a standard presentation of the results of the disposability analysis.

- Criteria were developed to standardize the analysis of each material. The three fundamental criteria classes were environmental, operational, and economic.

- A methodology for employing the criteria was developed. Utilizing the methodology, an analysis was performed to determine the preferred disposal process.

- The results of the analyses were entered on the Summary Fact Sheets for each individual material.

Although this study was not intended to quantify the amount of military waste materials, an indication of the magnitude of the overall waste generation problem at U.S. Army facilities is shown by the refuse data that is displayed in Table 1.

Table 1
Waste Generation at U.S. Army Facilities

REFUSE, CUBIC YARDS COLLECTED PER YEAR	TONS PER CALENDAR DAY*	NO. OF BASES (INDUSTRIAL)	NO. OF BASES (CONTRACTOR OPER)	NO. OF BASES (OTHER)	TOTAL BASES	% OF ALL BASES
1,000 - 50,000	.4 - 20.5	11	10	35	56	43
50,000 - 100,000	20.5 - 41.1	4	1	11	16	12
100,000 - 200,000	41.1 - 82.2	-	4	18	22	17
200,000 - 300,000	82.2 - 123.3	1	3	13	17	13
300,000 - 400,000	123.3 - 164.4	-	-	5	5	4
400,000 - 500,000	164.4 - 205.5	-	-	3	3	2
500,000 - 600,000	205.5 - 246.6	-	-	5	5	4
600,000 - 700,000	246.6 - 287.7	-	-	2	2	2
700,000 - 800,000	287.7 - 328.8	-	-	1	1	1
800,000 - 900,000	328.8 - 369.9	-	-	2	2	2
900,000 - 1,000,000	369.9 - 411.0	-	-	1	1	1
OVER 1,000,000	411.0 - 941.1	-	1	-	1	1
TOTAL		16	19	96	131	102**

*ASSUME 300 LB/CU YD (COMPACTED)

**TOTAL GREATER THAN 100% DUE TO ROUNDING.

DATA COMPILED FROM <u>FACILITIES ENGINEERING, ANNUAL SUMMARY OF OPERATIONS, FISCAL YEAR 1971</u>, OFFICE OF THE CHIEF OF ENGINEERS, DEPARTMENT OF THE ARMY

II. DESCRIPTION OF THE METHODOLOGY; DEVELOPMENT, AND APPLICATION

This chapter of the report is organized into four separate sections. These sections present:

- The manner in which the materials were selected and grouped in generic categories

- The general disposability characteristics for each material category

- A summary of waste management methods that are applicable to packaging waste

- A summary of the criteria developed and methodology utilized to determine the preferred disposal process.

1. SELECTION OF MILITARY PACKAGING MATERIALS TO BE INCLUDED IN THIS STUDY

The list of military packaging that was selected for analysis was developed in close coordination with officials of Natick Laboratories. The selected materials represent those that are most commonly used and are presented in Table 2.

Although the list of materials is not meant to be all inclusive, it does represent a broad overview of the common materials that are used for military packaging purposes.

Table 2 provides each of the following descriptions for the individual packaging materials.

- Material Number—A sequential numbering system has been employed so that one number is assigned to each specific military packaging material. This same number for each material is identified on its Summary Fact Sheet and on its Numerical Process Evaluation Matrix, which appear later in Chapter III and Appendix C, respectively, of this report.

Table 2
Common Military Packaging Materials

MATERIAL NUMBER	CATEGORY/ NAME	COMMON NAME (FORM)	USE	FED/MIL. SPECS.
	CHEMICALS			
1	ACETONE	ACETONE (LIQUID)	SOLVENT	O-A-51
2	BENZENE	BENZOL (LIQUID)	SOLVENT	VV-B-231
3	CARBON TETRA-CHLORIDE	CARBON TETRACHLORIDE (LIQUID)	SOLVENT	
4	CORROSION PREVENTIVE	CORROSION PREVENTIVE (FLUID)	PRESERVATIVE	MIL-C-6529 MIL-C-15074 MIL-C-16173 MIL-C-81304 MIL-C-11796
5	CORROSION PREVENTIVE	DESSICANT (POWDER)	DEHYDRATING AGENT	MIL-D-3464
6	CORROSION PREVENTIVE	OIL TYPE VOLATILE CORROSION INHIBITOR (FLUID)	PRESERVATIVE	MIL-I-23310
7	CORROSION PREVENTIVE	VCI (SOLID)	PRESERVATIVE	MIL-I-22110
8	DETERGENT	ALKALI CLEANING COMPOUND (LIQUID)	DETERGENT	P-C-436
9	DETERGENT	DETERGENT (LIQUID)	DETERGENT	MIL-D-16791
10	GREASE	GREASE (FLUID)	PRESERVATIVE	MIL-G-7711 MIL-G-23827 MIL-G-10924
11	LUBRICATING OIL	LUBRICATING OIL (LIQUID)	PRESERVATIVE	VV-L-800 MIL-L-3150
12	METHANOL	WOOD ALCOHOL (LIQUID)	SOLVENT	O-M-232
13	PETROLATUM	PETROLATUM (LIQUID)	PRESERVATIVE	MIL-C-10382
14	PETROLEUM CLEANING SOLVENT	STODDARD SOLVENT (LIQUID)	SOLVENT	P-D-680

Table 2 (Continued)

MATERIAL NUMBER	CATEGORY/ NAME	COMMON NAME (FORM)	USE	FED/MIL. SPECS.
15	PETROLEUM DISTILLATE	MINERAL SPIRITS (LIQUID)	SOLVENT	TT-T-291
16	TETRACHLORO-ETHYLENE	PERCHLORO-ETHYLENE (LIQUID)	SOLVENT	O-T-236
17	TRICHLORO-ETHYLENE	PERCHLORO-ETHYLENE (LIQUID)	SOLVENT	O-T-634
	GLASSES			
18	GLASS	FIBERGLASS (FIBER)	CUSHIONING	MIL-C-17435
19	GLASS/ PLASTIC	FIBERGLASS (SHEET)	CONTAINERS, TRAYS	
20	GLASS	GLASS (SOLID STOCK)	CONTAINERS	
21	MINERAL	VERMICULITE (FIBER)	CUSHIONING	MIL-V-21628 MIL-V-23776
	METALS			
22	ALUMINUM	ALUMINUM (FOIL)	TRAYS, WRAPPING	MIL-A-148
23	ALUMINUM	ALUMINUM (SHEET)	CANS, TUBES	QQ-A-250
24	LEAD	LEAD (SHEET)	TUBES	QQ-L-201
25	STEEL, IRON	METAL CYLINDERS (SOLID STOCK)	CYLINDERS, CAPS	
26	STEEL, IRON	METAL DRUMS (SHEET)	DRUMS	PPP-D-705 PPP-D-711
27	STEEL, IRON	METAL STRAPPING (STRAPS)	STRAPPING	QQ-S-781
28	TIN-PLATED STEEL	TIN CANS (SHEET)	CANS	PPP-C-96 PPP-C-29
29	TIN-PLATED STEEL/ ALUMINUM	BIMETALLICS (SHEET)	CANS	
30	VARIOUS METALS	AEROSOLS (SHEET)	PRESSUR-IZED CANS	PPP-C-96

Table 2 (Continued)

MATERIAL NUMBER	CATEGORY/ NAME	COMMON NAME (FORM)	USE	FED/MIL. SPECS.
	PAPERS			
31	FIBER-BOARD	COATED CORRUGATED CONTAINERBOARD (SHEET)	CONTAINERS	PPP-B-1608
32	FIBER-BOARD	CORRUGATED AND SOLID BOARD OR CONTAINER-BOARD (SHEET)	CONTAINERS	PPP-B-640 PPP-B-676 PPP-B-1364 PPP-B-636 PPP-F-320
33	FIBER-BOARD	WAX IMPREGNATED CORRUGATED BOARD (SHEET)	CONTAINERS	PPP-B-1163 MIL-C-3955
34	PAPER	BAG AND SACK (SHEET)	BAGS, SACKS	PPP-S-30 UU-B-36 UU-S-48
35	PAPER	COATED, IMPREGNATED (SHEET)	WRAPPING, BAGS	MIL-P-20293 UU-P-134
36	PAPER	CONVERTING, ENVELOPE (SHEET)	ENVELOPES, TAPES	PPP-T-45
37	PAPER	NEWSPRINT (SHEET, SHREDS)	WRAPPING, DUNNAGE	
38	PAPER	PULP (MOLDED)	TRAYS	
39	PAPER	TISSUE (SHEET)	WRAPPING	UU-P-553
40	PAPER	VCI TREATED PACKAGING MATERIALS (SHEET)	CONTAINERS	MIL-P-3420
41	PAPER	WAX PAPER (SHREDS)	WRAPPING DUNNAGE	
42	PAPER	WRAPPING (SHEET)	WRAPPING, BAGS	UU-P-268
43	PAPER-BOARD	CHIPBOARD, BOXBOARD (SHEET)	BOXES	UU-C-282 PPP-B-566
44	PAPER-BOARD	SPIRALLY WOUND FIBER CAN (TUBE)	CAN	MIL-C-2439
45	PAPER/ FOIL LAMI-NATION	POLYOLEFIN - FOIL-PAPER (SHEET)	WRAPPING, BARRIER MATERIAL	MIL-B-131

Table 2 (Continued)

MATERIAL NUMBER	CATEGORY/ NAME	COMMON NAME (FORM)	USE	FED/MIL. SPECS.
46	PAPER-BOARD/ METAL	METAL-EDGED PAPER-BOARD (SHEET)	BOXES	PPP-B-665
47	PAPER-BOARD/ METAL	METAL-EDGED PAPER-BOARD (SHEET)	DRUMS, TUBES	PPP-D-723
48	FIBER-BOARD/ WOOD	WOOD-CLEATED FIBER-BOARD (SHEET)	BOXES	PPP-B-591
	PLASTICS			
49	ACRYLONITRILE BUTADIENE STYRENE	ABS (SOLID STOCK, SHEET)	TRAYS, CONTAINERS	L-P-1183
50	CELLULOSICS	CELLOPHANE (FILM)	WRAPPING, BAGS	L-C-110 PPP-B-15
51	CELLULOSICS	CELLULOSE ACETATE (FOAM)	CUSHIONING	PPP-C-843
52	CELLULOSICS	CELLULOSE ACETATE (SHEET, FILM)	WRAPPING	L-P-504
53	CELLULOSICS	CELLULOSE ACETATE BUTYRATE (SOLID STOCK)	CONTAINERS	L-P-397 L-P-349
54	CELLULOSICS	STRIPPABLE PLASTIC COATING - COLD (FILM)	COATING	MIL-P-45021
55	CELLULOSICS	STRIPPABLE PLASTIC COATING - HOT (FILM)	COATING	MIL-P-149
56	EPOXY	EPOXY RESIN (FILM)	COATING	MIL-R-21931
57	IONOMER	SURLYN (FILM, SHEET)	WRAPPING, MOLDED PARTS	MIL-P-46124
58	IONOMER	SURLYN (FOAM)	CUSHIONING	
59	PHENOLICS	BAKELITE (SOLID STOCK)	TRAYS, CONTAINERS	MIL-R-3745 L-P-1125
60	PLASTIC/FOIL LAMINATION	POLYOLEFIN/ ALUMINUM/ POLYESTER, MARPLEX (SHEET)	WRAPPING, POUCHES	

Table 2 (Continued)

MATERIAL NUMBER	CATEGORY/ NAME	COMMON NAME (FORM)	USE	FED/MIL. SPECS.
61	POLYACRYLICS	LUCITE, PLEXIGLAS (SOLID STOCK, SHEET)	CONTAINERS	L-P-507 MIL-P-8184
62	POLYAMIDS	NYLON (CLOTH)	SACKS	MIL-C-81288
63	POLYAMIDS	NYLON (FIBER)	CORD	MIL-C-5040
64	POLYCAR-BONATE	POLYCARBONATE (SHEET)	WRAPPING	MIL-P-46144 MIL-P-83310
65	POLYCAR-BONATE	POLYCARBONATE (SOLID STOCK)	CONTAINERS	
66	POLYESTER	DACRON (FIBER)	STRAPS	
67	POLYESTER	MYLAR (FILM)	POUCHES	L-P-377
68	POLYOLE-FIN	POLYETHYLENE (FILM)	WRAPPING, POUCHES	L-P-378
69	POLYOLE-FIN	POLYETHYLENE (SOLID STOCK)	CONTAINERS	MIL-C-40030
70	POLYOLE-FIN	POLYPROPYLENE (FIBER)	CORD	MIL-R-24049
71	POLYOLE-FIN	POLYPROPYLENE (FILM)	WRAPPING, POUCHES	L-P-378
72	POLYOLE-FIN	POLYPROPYLENE (FOAM)	CUSHIONING	MIL-C-81822
73	POLYOLE-FIN	POLYPROPYLENE (SOLID STOCK)	CONTAINERS	L-P-393 L-P-394
74	POLYSTYRENE	POLYSTYRENE (SHEET, FILM)	WRAPPING	L-P-506
75	POLYSTYRENE	POLYSTYRENE (SOLID)	CONTAINERS, MOLDED PARTS, SHEETING	L-P-396
76	POLYSTYRENE	STYROFOAM (FOAM)	CONTAINERS	
77	POLYSTYRENE	STYROFOAM (FOAM)	CUSHIONING	PPP-C-850

Table 2 (Continued)

MATERIAL NUMBER	CATEGORY/ NAME	COMMON NAME (FORM)	USE	FED/MIL. SPECS.
78	POLYSTYRENE	STYROFOAM (PELLETS)	DUNNAGE	MIL-P-19644
79	POLYSULPHONE	POLYSULPHONE (SOLID STOCK)	TRAYS, CONTAINERS	MIL-P-46120
80	POLYTETRAFLUOROETHYLENE	TEFLON (SHEET, FILM)	WRAPPING	MIL-P-22241
81	POLYTETRAFLUOROETHYLENE	TEFLON (SOLID STOCK)	CONTAINERS	L-P-403
82	POLYURETHANE	POLYURETHANE (FILM)	WRAPPING	MIL-P-43604
83	POLYURETHANE	POLYURETHANE (FOAM)	CUSHIONING	MIL-P-26514
84	POLYURETHANE	POLYURETHANE (SOLID STOCK)	CONTAINERS	MIL-M-24041 MIL-C-38226
85	POLYVINYL ALCOHOL	PVA (SHEET)	WRAPPING	
86	POLYVINYL ALCOHOL	PVAC (SHEET)	WRAPPING	L-P-536
87	POLYVINYL CHLORIDE	PVC (FILM)	WRAPPING, POUCHES, WATERPROOF COVERS	L-P-375
88	POLYVINYL CHLORIDE	PVC (SOLID STOCK)	CONTAINERS, BLISTER PACKAGES, LINERS	L-P-535
89	POLYVINYLIDENE CHLORIDE	SARAN, PVDC (FILM)	WRAPPING	L-P-370
90	RUBBER	LATEX (FOAM)	CUSHIONING	MIL-R-5001
	TEXTILES			
91	BOUND FIBER	RUBBERIZED HAIR (FIBER)	CUSHIONING	PPP-C-1120
92	CANVAS, RUBBERIZED	TARP (CLOTH)	TARPAULIN	

Table 2 (Continued)

MATERIAL NUMBER	CATEGORY/ NAME	COMMON NAME (FORM)	USE	FED/MIL. SPECS.
93	COTTON	COTTON (CLOTH)	CUSHIONING	
94	COTTON	COTTON (CLOTH)	RAGS	
95	COTTON	COTTON (CLOTH)	SACKS	PPP-B-1358 PPP-B-1087
96	FELT	FELT (SHEET)	CUSHIONING	C-F-202 C-F-206
97	JUTE	BURLAP (CLOTH)	SACKS	PPP-B-35 CCC-C-467
98	SCRIM/FOIL LAMINATION	POLYOLEFIN/ ALUMINUM/SCRIM (SHEET)	BARRIER MATERIAL	MIL-B-131
	<u>WOODS</u>			
99	WOOD	COOPERAGE (BOARD)	KEGS	NN-K-231 PPP-B-41
100	WOOD	EXCELSIOR (SHREDS)	DUNNAGE	PPP-E-911
101	WOOD	PLYWOOD (SHEET)	CRATES	NN-P-530
102	WOOD	VENEER (SHEET)	CRATES	PPP-V-205
103	WOOD	WOOD (BOARD)	CRATES PALLETS	PPP-B-621 MIL-P-3938
104	WOOD/ METAL	NAILED OR WIREBOUND (BOARD)	CRATES PALLETS	PPP-B-585 PPP-B-587

- Category — This is the fundamental class of the specific packaging materials. The different categories utilized are chemicals, glasses, metals, papers, plastics, textiles, and woods.

- Name — This is the common generic name of the material.

- Common Name (Form) — This is the common name of the material. In parentheses is the form in which the material is analyzed.

- Use — This is the common intended use of the material.

- Federal/Military Specs — This is the federal or military specification that defines the particular packaging material.

2. GENERAL DISPOSABILITY CHARACTERISTICS OF MATERIALS BY CATEGORY

Although packaging materials can be described by their physical and chemical characteristics, there are no universally accepted criteria for their disposability. Therefore, during this study disposability criteria for the evaluation of the selected materials were developed for each applicable disposal process. For example, these criteria readily permit an initial determination that a noncombustible material would be undesirable for disposal by an incineration process. Further application of the criteria may determine that this material is a good candidate for disposal by the sanitary landfill process.

This section briefly describes the disposability characteristics of each chemcial and solid.packaging material category. The Criteria Development Analysis, as described in Chapter II, Section 4, and in Appendix B of this report, contains a more comprehensive description of the disposability characteristics of packaging material.

(1) Chemicals

Chemical (liquid) preservative and packaging compounds, represented by 17 of the materials included in this study, are normally used in conjunction with other forms of packaging to protect a product from abrasion, wear, or chemical corrosion.

The chemicals investigated in this study include the corrosion preventives, oils, solvents, and detergents that are used by the Army in packaging or ancillary to packaging, such as corrosion removal.

In general, chemical packaging materials exhibit the following disposability characteristics:

- High combustibility
- Material density ranging from 53 to 72 lb/cu ft
- High toxicity.

These disposal characteristics are generally applicable to the range of chemicals that was analyzed in this study. Therefore, separate sets of specific disposal characteristics for individual categories of chemicals were not developed.

The typical methods for disposal of chemical wastes by recovery and reuse are based upon small- and medium-quantity lots.

The chemicals included in this study (primarily solvents) are relatively inexpensive. Consequently, equipment and procedures for reclaiming the chemicals of small lots (less than 1 liter) would not be economical. However, carbon tetrachloride, tetrachloroethylene, trichloroethylene, Stoddard solvent, and benzene when used as dry cleaning fluids are exceptions, since most dry cleaning equipment includes a small recovery and cleaning still.

The Summary Fact Sheet for each type of liquid waste contains a ranking for each method of disposal applicable to the particular chemical involved. Recommended procedures for disposal of liquids by either recovery or final disposal are also briefly described in the Summary Fact Sheets. Procedures are indicated for disposal of small spills of liquids and for recovery or final disposal of large quantities of highly hazardous liquids.

Some liquid materials, such as pastes and hazardous liquids, require special handling for spills. Paste materials,

such as greases and petrolatum, are normally used as coatings for prevention of corrosion or as lubricants. These materials will remain relatively consistent if spilled and would therefore, not constitute a typical spill. Generally, small spills of these materials can be disposed, large spills can be recovered, and the uncontaminated portion of the material can be reused. However, after the paste materials have been used as lubricants or as coatings for prevention of corrosion, they are generally not reclaimable.

The special procedures for disposal of the paste materials also apply to hazardous chemicals. However, the following additional procedures must be used for the handling of a hazardous chemical spill.

- Prepare the chemical handling area for emergency conditions prior to handling the material. Emergency facilities should be constructed (for example, containment berms) with safety and emergency procedures in ready condition and close at hand. Spills should not be allowed to enter sewers or waterways.

- Evacuate the area of all personnel except those properly equipped, trained, and necessary for containment and collection of the material.

- Follow prescribed personnel safety procedures such as the wearing of respirators.

- Extinguish and remove all sources of ignition if the chemical is flammable.

- Contain the spill.

- Collect the chemical as soon as containment is complete. Necessary equipment should be stored in the area and easy access is imperative. Examples of equipment that may be needed include:

  - Scoops and pails
  - Absorbent materials
  - Covered containers
  - Cleaning compounds such as detergents

- Mops
- Water vacuums
- Storage drums.

- Collect as much of the chemical as possible in appropriate containers (some solvents will dissolve plastics).

- Mark all containers with the name of the chemical, date of spill, description of accident (i.e., spilled into dirt, grass, etc.), and a responsible person to contact for information on the accident. A supplier may require additional information to simplify reprocessing.

- Wash the spill site.

- Transport containers of the contaminant to storage, recovery, or disposal areas as determined by the cognizant facility disposal officer.

(2) Solids

Solid materials are used for a variety of military packaging including solid and flexible containers, wrappings, seals, partitions, strappings, bags, printed matter, and pallets. Of the 104 materials analyzed in this study, 87 were solids. The solids can be readily categorized as being either glass, metal, paper, textile, wood, or plastic. The relative dominance of the solids in the study and their ready ability to be categorized provided the basis for developing disposability characteristics for each solid material category. The more general characteristics of the liquids have prevented them from being separated into such distinct categories.

The general disposability characteristics of the solids' categories are presented in the following paragraphs.

1. Glass

Glass makes a strong container with high gloss and transparency. It is chemically inert and an absolute

barrier against all external influences except temperature and light. Based on total U.S. tonnage, glass represents approximately 18 percent of the total tonnage of packaging materials.

Among packaging materials, glass can present an incineration problem regardless of the package size or shape in an incinerator. Glass may liquefy and then deposit on the incinerator walls or floor surfaces, forming a bond with the firebrick which is greater than the adhesion of the brick itself. When these surfaces are cleaned, the brick is unavoidably eroded.

Generally, glass exhibits the following disposability characteristics:

- Easily fragmented
- Easily compacted
- Separable by optical means
- Nontoxic
- Noncombustible
- Highly resistant to biological and chemical degradation
- Average material density of 156 lb/cu ft.

2. Metal

Metal, which accounts for approximately 16 percent of the total tonnage of packaging wastes, has one overriding advantage over any other kind of packaging material—its strength. Metal containers also generally protect their contents well from the effects of heat, cold, moisture, rough handling, and light.

Metal containers are noncombustible and are not reported to cause damage to incinerators unless they are overly massive. In fact, there is some indication

that the presence of metal containers can have a beneficial effect by creating hollows in the refuse, thus aiding air movements and combustion.

Generally, metal exhibits the following disposability characteristics:

- Noncombustible
- Nontoxic
- Highly resistant to biological and chemical degradation
- Separable by mechanical means (ferrous metals).

3. Paper

Paper and paperboard dominate the packaging materials field and represent about 50 percent of all packaging consumed. This dominance results from paper's ability to package almost any item, its relatively low cost and its ready ability to be printed and combined with other materials. Paper's wide use for packaging also results from its use as a secondary form of packaging contained within a primary container.

In 1969, of the 53 million tons of fibrous materials consumed in papermaking, 19 percent was due to recycled waste paper. Because of a number of contaminants, such as clay coating, asphalt, plastic coatings, adhesives, and laminations, the desirability of paper as a secondary (recyclable) material is reduced. Paperboard and construction grade paper are the principal paper stocks that are recycled.

The disposability characteristics of paper packaging materials are as follows:

- High cellulose content
- Easily fragmented and compacted

- Highly combustible
- Nontoxic
- Susceptible to biological and chemical degradation
- Average material density ranging from 44 to 72 lb/cu ft
- Combustion at temperatures ranging from 200 to 500°F and heat of combustion of approximately 7500 Btu/lb.

4. Textiles

Textiles account for about 0.5 percent of all packaging wastes. Most textile packaging is in the form of bags or sacks, which are made from either burlap or cotton. Only a small amount of synthetic fibers is used. Burlap bags are strong and have good tear and snag resistance characteristics. On the other hand, cotton sacks have a tigher weave than burlap bags and are usually used for products that might sift through the looser weave of burlap.

Textile bags are often collected, renovated, and directly reused. Burlap bags may be reused 10 to 12 times before disposal. Cotton sacks are usually put to a secondary use such as for yard goods for items such as rags and towels.

The general disposability characteristics of textiles are as follows:

- High cellulose content
- Good to excellent fragmentability and compactibility
- Nontoxic
- Highly susceptible to chemical and biological degradation

- Average material density of 95 lb/cu ft
- Combustion at approximately 500°F and heat of combustion of 8000 Btu/lb.

5. Wood

Wood is a traditional packaging material but represents only a minor segment of all packaging materials. In terms of U.S. tonnage, wood packaging materials account for about 9 percent of all packaging materials consumed.

Wood containers are primarily used because of their relatively low cost and high strength. They often go through several cycles of use before they are discarded.

Wood is usually used in its natural state; it is seldom coated or chemically altered. Unlike paper, wood packaging materials are not usually recycled, but as stated above, are usually directly reused.

In general, the disposability characteristics of wood packaging materials are as follows:

- High cellulose content
- Nontoxic
- Susceptible to biological and chemical degradation
- Average material density of 27 lb/cu ft
- Combustion temperature of approximately 525°F
- Heat of combustion of approximately 8500 to 9200 Btu/lb.

6. Plastic

Within the solid materials category, plastic represents a large and increasing percentage of the total amount of packaging materials. In addition, plastic packaging materials represent a wide range of chemical and physical characteristics. Minor changes in the chemical composition of some plastics may result in significant changes in their disposability.

For these reasons a set of general disposability characteristics applicable to all plastic materials could not be developed. Therefore, the disposability of the plastics has been specifically characterized for each of the applicable disposal processes including: reuse, recycle, pyrolysis, composting, incineration, and landfill. The disposability characteristics of plastics for each of these processes are as follows:

- Reuse — The reuse of plastic containers is presently limited by the following factors:
  - The present nonreturnable plastic containers used by the Army will require extensive redesigning in order to increase their durability, strength, and capability to pass through a decontamination process for reuse.
  - Additional decontamination facilities will be required at all bases where this process is performed.
- Recycle — A key factor influencing the recycling of plastics is the availability of a market for the waste packaging material once it has been collected and segregated. Plastics used as packaging materials (e.g., in fabrication of bottles, films, and coatings) have tightly controlled specifications, but molded and extruded products such as hardwares and pipes require raw materials of wider specification range. Thus, scrap from monoplastics (e.g., PVA, polyolatin, and

polyethylene) can be used for pipes, pallets, and a variety of structural products. Such recycling will require an extensive sorting of packaging waste into the different types of plastic. Mechanical means to separate plastic scrap are not currently available, and therefore, unless manual separation is utilized, the use of the packaging material wastes would be limited to construction and building materials; for example, plastics may be mixed with traditional construction materials in walls, roofs, floors, ceilings, and roads. Reprocessing of a mixture of different plastics normally produces products with poor physical properties.

Pyrolysis—Pyrolysis of a comparatively homogeneous material containing a high percentage of organic polymer was recently investigated by the U.S. Bureau of Mines. That study demonstrated the technical feasibility of destructive distillation as a means for obtaining potentially valuable products from the polymer waste. Pyrolysis of thermoplastic polymer solid waste might be a very attractive reclamation method if it could be made to yield essentially only a single product (the monomer) in high yield. However, numerous past studies have shown that only a few polymers (e.g., polymethyl, methacrylate and polytetrafluorethylene) can be made to undergo such a reversible thermal depolymerization. The vast majority of polymers, including all the high tonnage thermoplastics, exhibit complex decomposition leading to a wide spectrum of products. The expense of separating even one or two pure components from such a complex nature is likely to be too high to make the process competitive as a source of chemicals. At present, the pyrolysis process for waste reclamation may be regarded more realistically as a potential source of higher grade fuel than the original waste.

- <u>Composting</u>—Although plastics are not compostible because they are not susceptible to rapid biodegradation, they do not cause significant problems if the refuse is shredded. Fine plastic particles behave as any other inert material such as small stones or slate; therefore, they would not be expected to have any detrimental effects on the root development and growth processes of plants.

- <u>Incineration</u>—Plastics do not ignite or burn readily in many types of conventional incinerators; but they do melt. As such, they deposit as smoldering molten puddles on the grate and may burn erratically or even explosively. Since they have very high heating values (15,000 to 20,000 Btu/lb), the resulting high temperatures require special furnace designs. In addition, the chlorinated plastics such as PVC liberate toxic and corrosive HCL as a combustion product.

- <u>Landfill</u>—The following characteristics of the plastic materials should be considered before selecting landfill as the preferred means of disposal:

  - Plastic materials generally do not decay or rot even after prolonged soil burial, and therefore represent some of the most persistent components in the fill. On the other hand, plastics can be considered the equivalent of an inert material such as broken concrete, and thus provide immediate stability to the landfill.

  - Plastics in certain physical forms may introduce special problems in landfills because they are difficult to compact efficiently with ordinary compacting equipment (tractors, draglines, or steel-wheeled compactors). For example, plastic bottles are not easily compacted

and only those in the lower strata of refuse become compressed by the overlying weight. Those with less covering weight are likely to remain intact and contribute to the springiness of the fill. The plastic films cause a problem because they tend to become entangled in the tread wheels and the radiators of spreading and compacting equipment.

3. SUMMARY OF APPLICABLE WASTE MANAGEMENT METHODS

This section presents a summary of waste management methods that are applicable to solid packaging waste. It is included because the solids represent nearly 90 percent of the individual materials analyzed in this study. They also comprise a much larger quantity of packaging wastes than the chemicals. A more complete description of these waste management methods is contained in Appendix A.

A general flow diagram for management of solid packaging waste is shown in Figure 1. The following discussion describes each block, i.e., process, shown on the flow diagram.

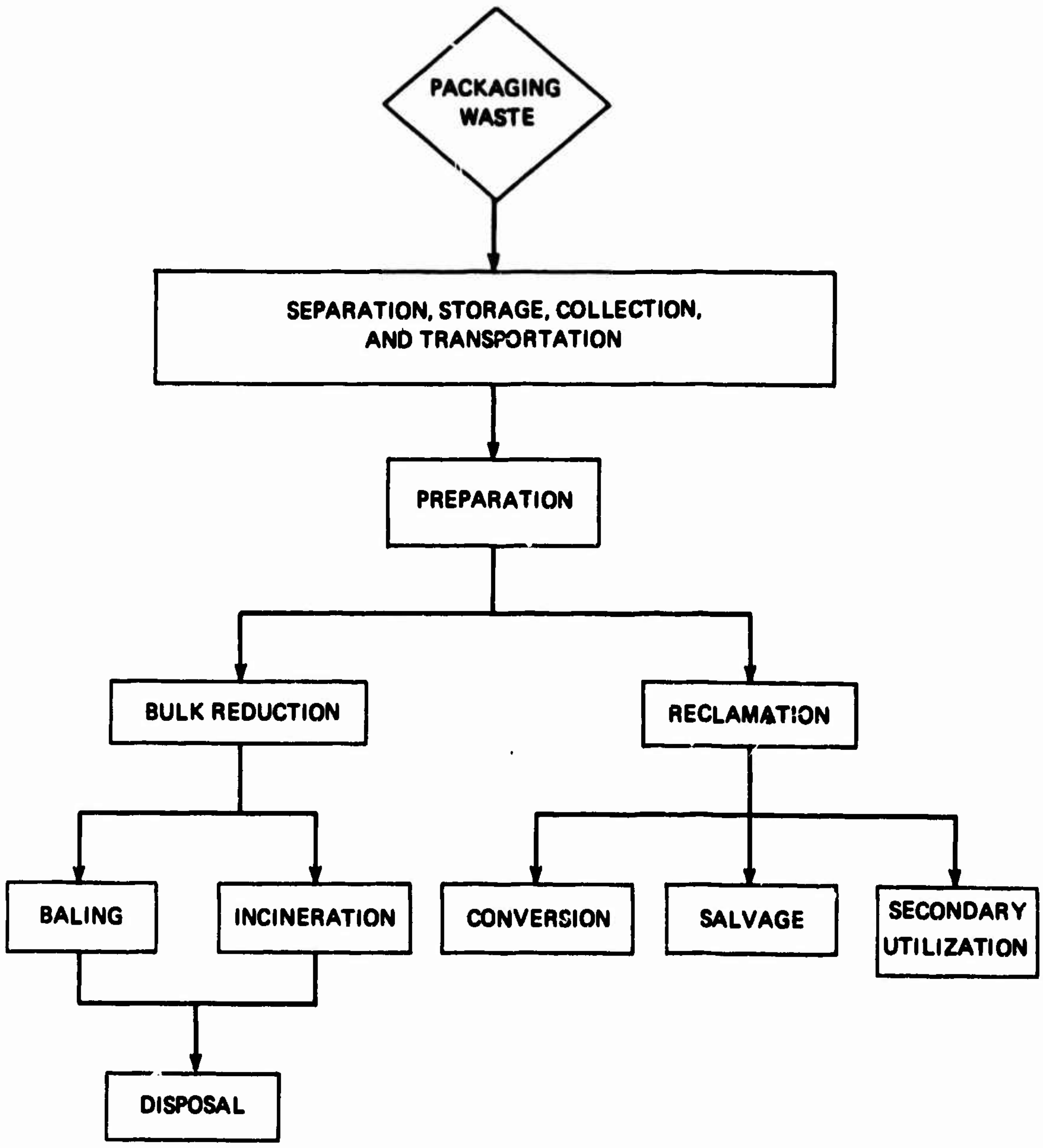
(1) Separation, Storage, Collection, and Transportation

The method of storage and handling of each type of packaging waste is properly determined by its eventual disposition. The discussion here covers source separation, storage, collection, and transportation.

The waste source is the point at which a packaging material becomes a packaging waste, typically upon opening a package and removing its contents. Source separation refers to the separate storage of waste materials when their mixing would interfere with their subsequent disposition.

In a warehouse or similar facility that handles large amounts of packaging materials, the wastes are typically stored in large metal bins that are mated to collection trucks to facilitate removal. Paper stock and certain other materials slated for reclamation can be bundled for shipping.

FIGURE 1
Flow Diagram for Management
of Solid Packaging Waste



Compaction devices designed to reduce storage space requirements are available in various shapes and sizes from at least 20 manufacturers. These devices pack waste materials into large bags or metal containers.

Collection vehicles serving commercial establishments or military bases are designed to cope with large containers and are generally operated by a single operator. They fall into four categories:

- Semiautomatic rear loaders, similar to the household refuse collection vehicles but equipped with a power device for lifting and tipping the containers

- Automatic front loaders that lift the container over the cab and dump its contents into the packer body behind

- Piggyback platforms that lift or pull the full container onto their chassis

- Small train-tractor, power vehicles that hook up a string of wheeled containers.

Long-distance hauling of solid wastes is effected with the aid of transfer stations that transfer the waste from collection vehicles onto trailer vans, railroad cars, or barges. Modern stations are normally equipped with a stationary compacting mechanism and may contain fragmentation devices. The number of such transfer stations is expected to grow rapidly as landfills move farther away from populated areas and more favorable cost factors improve their economic feasibility.

(2) Preparation

Preparation of packaging waste for subsequent processing may take the form of fragmentation and/or sorting. These steps are useful prior to a number of subsequent operations such as baling, incineration, pyrolysis, reclamation, and landfill and are conducted typically at a central processing facility. The requirement for preparatory steps is indicated on each material Summary Fact Sheet in Chapter III.

Reduction in the average size of the refuse fragment, known as fragmentation, comminution, or presizing, enhances the homogeneity, packing, and handling quality of refuse. The most common fragmentation equipment includes hammer mills, shredders, shears, and wet pulpers. Other devices with essentially similar functions are variously known as ball mills, cage disintegrators, chippers, crushers, cutters, disk mills, drum pulverizers, grinders, hoggers, and rasp mills.

Sorting of packaging waste into its constitutent materials, also known as separation or segregation, is essential in recovery operations, but it is also very useful in other processing steps where it permits the optional adjustment of operating conditions to each category of refuse.

Sorting techniques may be categorized loosely as:

- Manual
- Dimensional
- Dynamic
- Optical
- Electrical and magnetic.

In spite of the rising costs of labor, manual sorting from conveyors is still the most common method. It is employed at nearly all composting plants and some incinerators. Development of mechanical methods has been rather recent and consists largely of adaptation of proven techniques from the mineral processing industry. The alternative processes following preparation would be either bulk reduction or reclamation. Bulk reduction and its two subprocesses, as well as final disposal, are discussed immediately below. The discussion of reclamation and its three subprocesses begins under heading (7) on Page 30.

(3) Bulk Reduction

Reduction of the bulk or volume of packaging waste serves to decrease the handling, transportation, and disposal costs.

(4) Baling

Compression of packaging waste is the most direct method of bulk reduction. Its extent is governed not only by the applied pressure but also by the manner of application and the composition of waste. In the ideal configuration, all voids are eliminated, and the close contact between waste particles promotes adhesion and physical interlocking to form a cohesive, stable structure with a density approaching that of the solid material.

Large-scale, high-pressure compaction and baling of municipal waste was popularized with the announcement of a process for compressing refuse into sterile bales that could be clad in asphalt or concrete and used as building blocks. Since then, well over 50 United States' firms have entered the refuse baling field with equipment or management services.

In the narrow bulk reduction role, high-pressure baling offers a number of advantages over conventional incineration.

- It accepts all types of waste including noncombustibles and plastics.
- It yields greater volume reduction on the basis of all municipal wastes (80 to 90 percent versus 65 to 75 percent).
- Its capital and operating costs are, respectively, one-tenth and between one-third and one-half of corresponding incineration costs.
- It requires less maintenance and operating skill.
- It generates no significant air or water pollution.
- It produces a residue that is easier to handle, transport, and landfill.
- If affords nearly full future recovery of waste materials.

High-pressure baling ceases to be superior to incineration when the incinerator process is extended to allow recovery of waste heat.

(5) Incineration

Conventional incineration of packaging and other solid wastes has been gradually replacing open burning as a common approach to bulk reduction. Nevertheless, burning in the open air still remains the cheapest, most widely used, as well as least desirable method. The smoke and stench contribute appreciably to the local air pollution problem, while incompletely burned organic waste putrefies and attracts rats and flies.

A modern incinerator consists of a combustion chamber where the refuse burns on moving grates at 760 to 982°C (1400 to 1800°F), a secondary combustion zone for burning off combustible gases, and flues to convey the exhaust gases to the stack and then to the atmosphere. The flues of modern incinerators are equipped with pollution control devices to minimize the amount of pollutants discharged into the atmosphere. After incineration, about 10 to 35 percent of the original volume of refuse consisting of sterile incombustible residue and fly ash remains for final disposal.

The major drawbacks of incineration still remain unresolved. These include the high cost of construction, maintenance, and pollution control; frequent downtime to replace refractory lining; grate elements damaged by excessive temperatures and corrosive gases, and incomplete combustion caused by heterogeneity of the waste change. The principal development efforts designed to correct some of the problems have focused on incineration of bulky waste, suspension of the waste charge, improved emission control, high-temperature incineration, and waste heat recovery.

The recovery of waste heat generated in the incineration of solid wastes, although practiced extensively in Western Europe, has only recently received well deserved attention in the United States, as part of the overall concern with air pollution control and the impending energy crisis. The two most common designs of waste heat recovery installations involve steam generation by a boiler located immediately after the conventional refractory furnace, or by water-bearing pipes imbedded in the furnace walls. The steam can then be used for space heating, for driving a steam turbine that could drive an electric generator, or for other applications.

High-temperature incinerators, also known as slagging incinerators, operate at 1500° to 1700°C (2732° to 3092°F), which is above the melting point of most common substances, whereas in conventional incinerators the temperature must be maintained below 1000°C (1832°F) to prevent damage to refractory lining and grate materials. The principal advantages of high-temperature incinerators are:

- Acceptance of practically all types of municipal waste
- Outstanding bulk reduction of up to 97 percent
- Complete combustion of all combustible materials
- Potential utilization of solid residue
- Generally reduced air pollutant emissions.

The disadvantages include:

- Need for auxiliary fuel and fluxing agent
- More rapid deterioration of refractory material
- High emission of NO_x.

High-temperature incineration technology has been largely borrowed from the steel industry, and the several existing designs are still in the development or demonstration stages.

(6) Disposal

The ultimate disposal of packaging and other solid wastes generally takes place on land, since dumping in the waterways has been banned and disposal at sea is restricted. The preferred form of land disposal is sanitary landfill, though other more innovative approaches have been tried as well.

Sanitary landfill is gradually replacing the open dump as the preferred method of land disposal and currently accounts for nearly 10 percent of waste disposal. Under this approach, the waste is discharged into a trench, compacted by bulldozers,

and covered with about 1/2 to 2 ft of compacted soil as a sanitary precaution.

The amount of wastes discharged at sea grew rapidly after World War II reaching 48.2 million tons (wet tonnage) in 1968, but it is now on the decline as a result of federal and state legislation.

In theory the oceans, which cover 71 percent of the earth's surface, offer a nearly unlimited capacity for assimilation of most wastes. This does not work out in practice primarily because of United States failure to control, treat, and distribute the wastes properly and because of the concentration of toxic substances in the food chain. Substantial pollution of the oceans is unacceptable not only on aesthetic grounds but also because of the need to preserve the photo-plankton that is largely responsible for generating the world's oxygen supply.

(7) Reclamation

Reclamation of useful components from the solid waste stream can take the form of conversion, salvage, or secondary utilization. The latter involves the use of an unaltered waste material in a new role and is illustrated by the employment of municipal refuse in altering topographic features for recreational purposes, the incorporation of glass cullet and fly ash in construction materials, or the underwater emplacement of discarded tires as fish habitats. Salvage entails the removal of a component from the waste stream and physical reprocessing into a form suitable for reuse. The most typical applications are the salvage of paper, glass, and metal scrap. Finally, conversion is defined as the chemical or biochemical transformation of a waste material into a useful product. The more promising chemical conversion processes include pyrolysis, hydrogenation, wet oxidation, and hydrolysis; the biochemical processes take in composting, anaerobic digestion, and biological fractionation. Waste heat recovery, a special form of conversion, was reviewed earlier under (5), Incineration.

(8) Conversion

Pyrolysis or destructive distillation is a time-tested process for breaking down organic substances into a carbonaceous char; an oil fraction containing acetic acid, acetone, and methanol; and a gas fraction consisting primarily of carbon monoxide, hydrogen, methane, and carbon dioxide. This is done by heating the materials at 600 to 1000°C (1112 to 1832°F) in the absence of oxygen. These products can then be separated and sold individually or used as fuel.

During the past decade, a number of successful developmental efforts have been undertaken by the Bureau of Mines Energy Research Center in Pittsburgh and other research institutions to adapt pyrolysis to the treatment of packaging and other municipal wastes. In light of the favorable technical and economic outlook indicated by pilot plant results and limited commercial experience, as well as freedom from the major problems plaguing municipal incinerators, a number of commercial enterprises have attempted to market their own pyrolysis systems. Thus far, no major municipal facilities have been built but several are under serious consideration.

Composting or aerobic digestion is a controlled process in which aerobic bacteria convert cellulose waste into a relatively inert humus-like material. The procedure generally requires shredding of the waste materials, removal of the 25 percent noncompostable fraction (metals, glass, plastics, and rubber), addition of water or sewage sludge, digestion for 4 to 6 days at 50 to 75°C (122 to 167°F), and curing to reduce the moisture content. The microbiological activity, and consequently the duration of the digestion phase, is a function of the particle size, moisture, oxygen access, temperature, pH, and carbon/nitrogen ratio of the waste material. Bulk reduction is between 30 and 50 percent, and the product is suitable for use as a soil conditioner, a base for fertilizer, or even in the manufacture of wallboard.

A number of other chemical and biochemical conversion processes for cellulosic waste have been investigated in the laboratory and pilot plant. Those showing most promise thus far are:

- Hydrogenation
- Wet oxidation
- Hydrolysis
- Anaerobic digestion
- Biological fractionization.

(9) Salvage

For the purpose of this study, salvage is defined as the processing of waste materials to restore their original utility and could take the form of direct reuse, recycling, or reprocessing. Direct reuse is best illustrated by returnable containers or pallets; recycling refers to the reuse of process waste at the manufacturing plant; reprocessing involves the cleaning and processing of the consumer or secondary waste for recycling by the manufacturer.

Several major solid waste salvage systems have been proposed during the past few years. They use different combinations of fragmenting, sorting, conversion, and reclamation techniques, and are currently in various stages of design, development, construction, and actual operation.

(10) Secondary Utilization

Secondary utilization, as previously mentioned, involves the use of an unaltered waste material in a new role and is illustrated by the employment of municipal refuse in altering topographic features for recreational purposes, the incorporation of glass cullet and fly ash in construction materials, or the underwater emplacement of discarded tires as fish habitats.

4. METHODOLOGY EMPLOYED IN THE DISPOSABILITY ANALYSIS

This section describes the methodology that was employed for analyzing the disposability of the solid and chemical packaging materials. This methodology can also be applied in the future to analyze new materials when they are considered for use by the military for packaging. The three distinct steps of the methodology that were followed during the analysis are illustrated by the waste disposal

logic diagrams that depict the physical process alternatives, the Summary Fact Sheet format that portrays a standard presentation of the disposability characteristics, and a summary of the criteria and analytical measures that determine the preferred disposal process. Each of these steps is separately discussed below.

(1) Waste Disposal Logic Diagrams

The waste disposal logic diagrams were prepared for repetitive reference during the analysis of each solid and chemical waste material. These diagrams illustrate the logic of the methodology followed in the study.

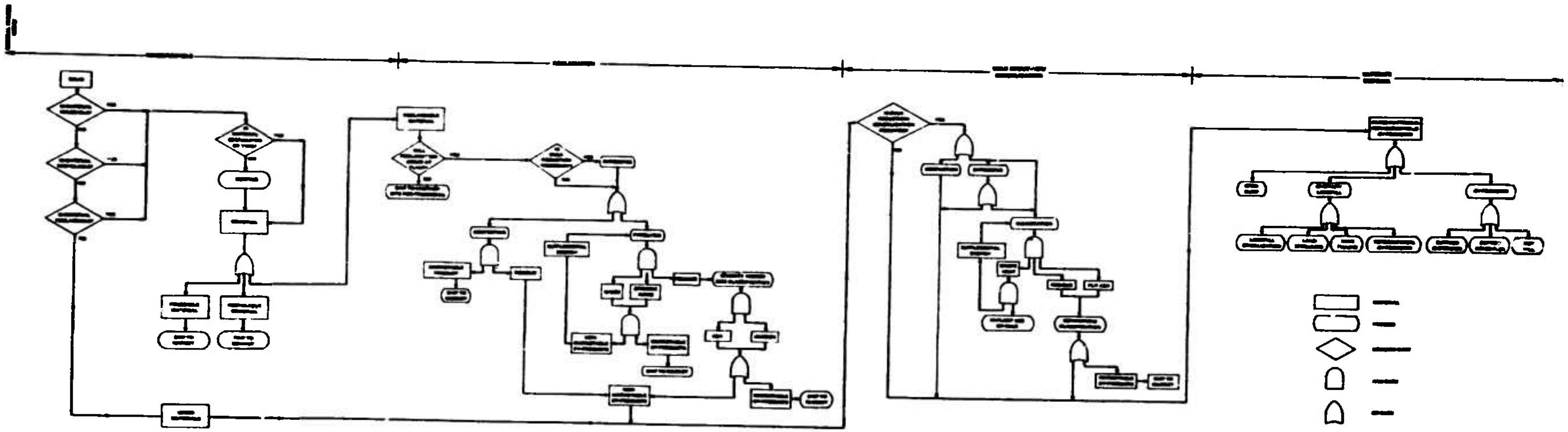
1. Solid Waste

The solid waste disposal logic diagram presented in Figure 2 depicts the physical process alternatives and their sequence for the disposal of solid waste packaging materials.

It cites the four general process modes or general means of disposal that may be utilized, namely, reuse or recycle, reclamation, bulk reduction or consolidation, and ultimate disposal. Under each process alternative the decision logic and the physical processes that may be employed to dispose of the solid waste are flow-charted. To assist the reader in obtaining familiarity with the diagram, the following guidance is provided.

Starting with a particular solid waste, first determine if the material is reusable, recyclable, or reclaimable. If the material is categorized as any of these, it must then be determined whether the waste is segregated from the solid waste stream. If it is not segregated, some means of sorting (i.e., manual or mechanical) must be employed. At this point, the material is classified (denoted by the "OR GATE") as either a reusable material, a recyclable material, or a reclaimable material. The reusable and recyclable materials are shipped to the marketplace, but the reclaimable material is sent through the reclamation logic.

FIGURE 2
Solid Waste Disposal Logic Diagram



At this point it must be decided where the reclamation will occur. If the material is to be reclaimed at the base, the need for bulk reduction should be examined. If required, the material will be sent to a shredder followed by composting or pyrolysis. The nonmarketable by-products enter the solid waste stream with the mixed materials (i. e., the materials that were determined not to be reusable, recyclable, or reclaimable).

The next decision is whether or not bulk reduction or consolidation is required. If the answer is yes, three alternative processes may be employed, namely, compaction for bulk consolidation, or shredding or incineration for bulk reduction.

Following these processes there will be mixed materials and/or nonmarketable by-products. For the ultimate disposal, three alternatives are evident. The wastes may be deposited in an open dump, in a sanitary landfill, or in the sea. Sanitary landfill and sea disposal each have associated with them several different types of disposal which may be employed.

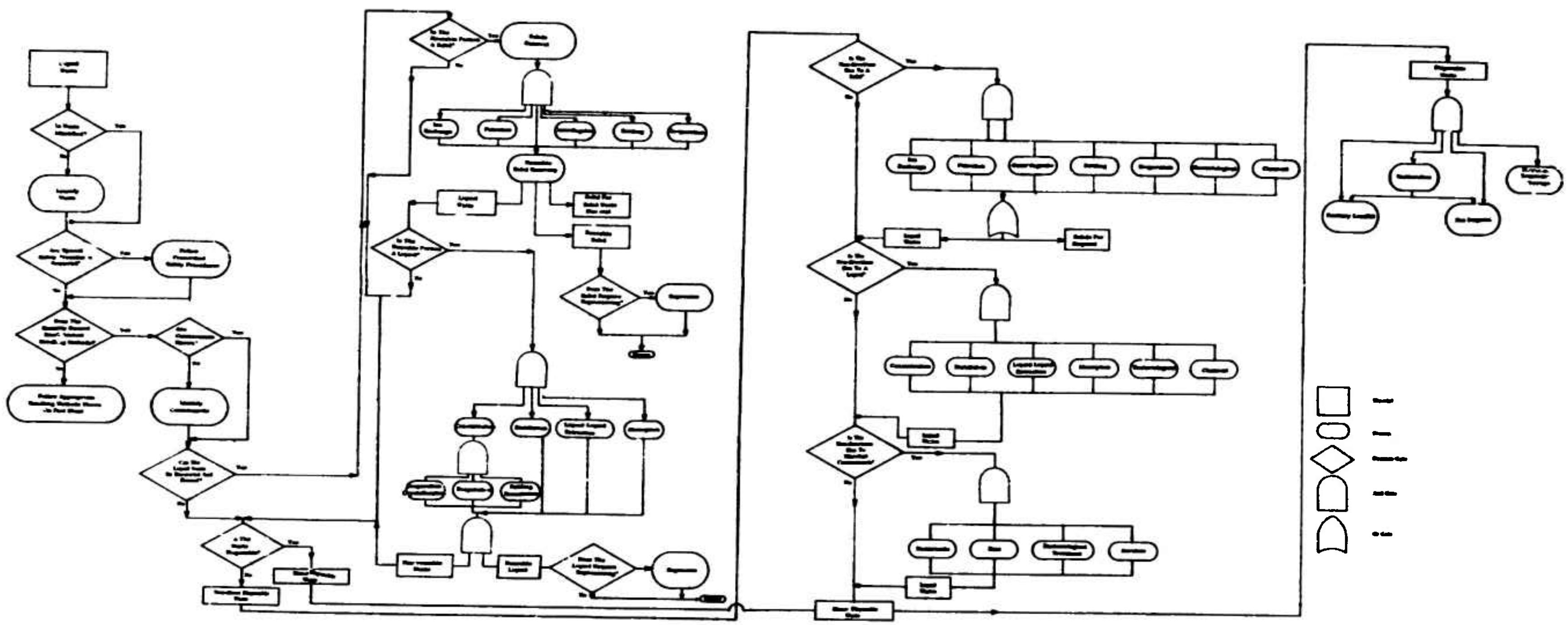
2. Liquid Waste

For the purposes of this study, liquid waste is defined as a liquid material that is no longer suitable for its original intended use without reprocessing or is only suitable for ultimate disposal. The liquid waste disposal logic diagram presented in Figure 3 illustrates the physical process alternatives and their sequence for the disposal of waste liquid preservative and packaging materials. The process alternatives, which are similar to those used in the disposal of solid wastes, permit the partial recovery and reclamation of portions of liquid waste materials.

To assist the reader in obtaining familiarity with Figure 3, the following guidance is provided.

Given a liquid waste, the first step is to determine the identification of the waste, the applicable safety procedures, and the contaminants.

FIGURE 3
Liquid Waste Disposal Logic Diagram



With the contaminants and the liquid identified, the next step is to determine whether the liquid waste is to be recovered and reused. If a portion of the liquid is recoverable and reusable, the reclamation methods are selected from the recovery process alternatives shown in the logic diagram.

Once the recoverable and reusable portions of the waste have been identified, the disposability of the non-reusable waste must be determined. This may be subject to local regulations and standards, which should be identified. In general, however, it requires removal of toxic components of the waste. As in the removal of reusable portions of the waste, the toxic components are removed by one or more of the nondirect waste disposal process alternatives shown on the disposal logic chart. For example, carbon tetrachloride in most cases cannot be directly landfilled since local regulations prohibit the open release of carbon tetrachloride vapors. In this case, the waste will have to be processed. In contrast, a liquid waste containing carbon tetrachloride can be incinerated (with certain precautions to prevent hydrochloric acid formation) without processing to remove the carbon tetrachloride.

(2) <u>Fact Sheet Format</u>

The primary product of this study is the Summary Fact Sheet, one for each material, which:

- Describes the nature of the material including its chemical and physical parameters that influence its disposal
- Recommends a preferred method of disposal
- Contains personalized data supplied by the cognizant officer at each Army base.

Since the physical and chemical properties and the alternative methods of disposal are very different between the solid and chemical (liquid) packaging wastes, it was necessary to

compose a separate Summary Fact Sheet that delineates these unique properties and disposal methods for each material form.

1. Solid Waste Summary Fact Sheet Format

The first five blocks of the Solid Waste Summary Fact Sheet format (Figure 4) are devoted to the general descriptive information about the material as follows:

- Material Description—This block of the Fact Sheet provides a concise description of the material being considered. It first states the general category (e.g., paper, wood, plastic); the specific material's name, common name, and form; and the material's use, specification number, and composition.

- Chemical Properties and Characteristics—This block lists those properties that significantly influence the method of disposal.

- Disposal Rating Summary—This block outlines any preprocessing steps that should be taken prior to the disposal; the operational, environmental, and total disposal rating; and the disposal and economic ranking. (The actual numerical calculations performed and entered in this block are presented in the next section entitled Criteria Development and Methodology.) Owing to the specific localized nature of the data, the economic ranking is to be entered by the base cognizant officer of each Army installation. The methodology to be employed is described in the economic section of this report, Appendix D.

- The "Total Disposal Ranking" indicates the sequence in which different processes should be used; that is, a ranking of 1 is the "best" process, 2 the "next best," and so on.

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER

1 MATERIAL DESCRIPTION

CATEGORY	
NAME	
COMMON NAME (FORM)	
USES	
FEDERAL/ MILITARY SPECIFICATION NUMBER	
COMPOSITION	

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	^{o}F
COMBUSTION TEMPERATURE	^{o}F
HEAT OF COMBUSTION	$\frac{BTU}{LB}$
MATERIAL DENSITY	$\frac{LB}{CU.FT.}$
BULK DENSITY	$\frac{LB}{CU.FT.}$

3 CHARACTERISTICS

FRAGMENTABILITY	
SEPARABILITY	
COMPACTIBILITY	
COMBUSTIBILITY	
TOXICITY	
BIOLOGICAL DEGRADABILITY	
CHEMICAL DEGRADABILITY	
REUSABILITY	

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE						
RECYCLE						
PYROLYSIS						
COMPOSTING						
BALING						
INCINERATION						
SANITARY LANDFILL						
SEA DISPOSAL						

PRE-PROCESSES: A = SEPARATION
B = COMPACTION
C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

FIGURE 4
Solid Waste Summary Fact Sheet Format

Because of the specific nature of the data, the next set of blocks are to be completed by the cognizant officer at each Army installation.

- Handling Data—As enumerated in the block, the cognizant disposal officer should fill in the specific manner in which the material is handled prior to disposal. Other notations may be the location and bin number of the solid waste.

- Onbase Disposal/Reclamation Data—In this block the cognizant officer should, if applicable, state the actual method of reclamation (pyrolysis or composting) which is used at the base.

- Off-Base Disposal/Processing Data and Off-Base Disposal/Recycling Data—In these blocks the cognizant officer should, if applicable, state the nature of the disposal, reclamation, or recycling method used, and the name and address of the secondary material handler.

- Notes and Comments—This final block of the Fact Sheet is reserved for the cognizant officer's comments relating to qualitative assessments, geographical or climatological limitations, the amount of the waste material handled on a per-day basis, etc.

2. Liquid Waste Summary Fact Sheet Format

In concept, the Liquid Waste Summary Fact Sheet format, as shown in Figure 5, is the same as the Solid Fact Sheet format; in content, the main difference between the two is the type of data or procedures shown on the Fact Sheets. For example, in the second block, which enumerates the chemical properties, there is greater detail in the Liquid Fact Sheet owing to the inherent characteristics of the chemical packaging materials. Likewise, some characteristics of solid packaging materials, such as fragmentability, may not apply to the chemical wastes and therefore is not cited.

SUMMARY FACT SHEET
LIQUID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER

1	MATERIAL DESCRIPTION
CATEGORY	
NAME	
COMMON NAME (FORM)	
USES	
FED/MIL SPECIFICATION NUMBER	

COMPOSITION	CONSTITUENTS	% BY WEIGHT

2	CHEMICAL PROPERTIES	
HEALTH	TOXIC HAZARD RATING CODE	
FIRE	TOXIC HAZARD RATING CODE	
REACTIVITY	TOXIC HAZARD RATING CODE	
FLASH POINT		°F
IGNITION TEMPERATURE		°F
BOILING POINT		°F
MELTING TEMPERATURE		°F
SPECIFIC GRAVITY		
EXPLOSIVE LIMITS		
HEAT OF COMBUSTION		BTU/LB.
VAPOR DENSITY (AIR = 1)		
SOLUBILITY IN WATER		

3 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	NOTES	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
RECOVERY/REUSE						
SANITARY LANDFILL						
INCINERATION						
SEA DISPOSAL						
MICROBIAL TREATMENT						

NOTES:

4* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

5 WASTE DISPOSAL METHOD FOR SMALL SPILL

6 RECOVERY/DISPOSAL METHOD OF HIGHLY HAZARDOUS LIQUIDS IN LARGE QUANTITIES

7* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

FIGURE 5
Liquid Waste Summary Fact Sheet Format

The blocks that have not been described previously in the Solid Waste Summary Fact Sheet format are presented below.

- Waste Disposal Method for Small Spill—This block describes the method to be used in disposing of a small quantity (generally 1 liter or less) of liquid wastes which occurs because of a spill.

- Recovery/Disposal of Highly Hazardous Liquids in Large Quantities—This block enumerates the recovery or disposal method to be used in the recovery or disposal of a large quantity of highly hazardous liquids which occurs because of either a large quantity spill or contamination.

(3) Summary of Criteria Development and Methodology

Described below is a summary of:

- The criteria developed in order to quantify the disposability characteristics

- The methodology employed by using a numerical procedure to determine total disposal rating and ranking that are entered in the Disposal Rating Summary section of the Summary Fact Sheets.

The criteria and methodology are illustrated in Tables 3 through 6. A comprehensive description appears in Appendix B, entitled "Specific Criteria Development and Methodology."

It is important to note that although the disposal processes and, hence, the criteria are different for the analysis of the solid and of the chemical waste packaging materials, the rationale behind each is the same.

Table 3
Relative Importance of Operational Disposability Characteristics

Characteristics	Direct Reuse	Recycle	Pyrolysis	Compost	Baling	Incineration	Sanitary Landfill	Sea Disposal
Fragmentability	- -	- -	0.2	0.2	- -	0.2	0.1	- -
Separability	0.5	0.4	0.2	0.2	- -	0.1	- -	- -
Material Density	- -	- -	- -	- -	- -	- -	0.2	0.2
Compactibility	- -	- -	- -	- -	0.4	- -	0.4	0.3
Baleability	- -	- -	- -	- -	0.6	- -	- -	- -
Combustibility	- -	- -	- -	- -	- -	0.5	- -	- -
Chemical and /or Biological Degradability	- -	- -	0.4	0.4	- -	- -	0.3	0.3
Market for Commodity	0.5	- -	- -	- -	- -	- -	- -	- -
Potential Damage to Equipment	- -	- -	- -	- -	- -	0.2	- -	- -
Regulatory or Technical Operating Restrictions	- -	0.6	0.2	0.2	- -	- -	- -	0.2
Total	1.0	1 0	1.0	1.0	1.0	1.0	1.0	1.0

Table 4
Relative Importance of Environmental Impact

Environmental Impact	Direct Reuse	Recycle	Pyrolysis	Compost	Baling	Incineration	Sanitary Landfill	Sea Disposal
Air Pollution Potential	- -	- -	0.2	0.2	0.2	0.2	0.2	0.2
Water Pollution Potential	- -	- -	0.2	0.2	0.2	0.2	0.2	0.2
Land Pollution Potential	- -	- -	0.2	0.2	0.2	0.2	0.2	0.2
Resource Depletion Potential	1.0	1.0	0.4	0.4	0.4	0.4	0.4	0.4
Total	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Table 5
Operational Rating Definitions of Incineration

Rating	Rating Code	Fragmentability	Separability	Burning Rate (Combustibility)	Potential Damage to Equipment From Materials
Excellent	9-10	Material needs no process for reduction	Sorting is possible by mechanical means	Very high	None
Good	7- 8	Material needs very light equipment or manual shredding for reduction	Mechanical sorting is possible but must be supplemented by manual sorting	High	None when incinerator is operated properly
Fair	5- 6	Material may be reduced by light equipment	Mechanical sorting is impracticable; can be easily sorted by manual means	Low	Can sometimes disturb system operations
Poor	3- 4	Material requires heavy equipment for reduction	Mechanical sorting is impracticable; cannot be easily sorted by manual means	Self-extinguishing	Seriously disturbs systems operations
Unsatisfactory	0- 2	Material requires specialized equipment for reduction	Mechanical and manual sorting is impracticable	Nil	Damage is catastrophic and causes plant shutdown.

Table 6

Environmental Rating Definitions of Air Pollution Potential

Rating	Rating Code	Harmful Gases	Particulate Emissions	Offensive Odors
Excellent	9-10	No harmful constituents.	No particulate emissions	No offensive odors
Good	7-8	Prevailing emissions well below applicable standards	Prevailing particulate emmissions well below applicable standards	A minuscule amount of offensive odors
Fair	5-6	Prevailing emissions below applicable atandards	Prevailing particulate emissions within applicable standards	An amount of offensive odors such that aesthetic enjoyment is dampened
Poor	3-4	Prevailing emissions above applicable standards	Prevailing particulate emissions just above applicable standards	An amount of offensive odors such that aesthetic enjoyment is hampered
Unsatisfactory	0-2	Prevailing emissions in excess of applicable standards	Prevailing particulate emissions well in excess of applicable standards	An amount of offensive odors such that aesthetic enjoyment is totally deprived

1. Criteria Development

In this analysis it was necessary to construct:

- Operational criteria to measure the adaptability or feasibility of a material's being processed by a disposal alternative
- Environmental criteria to measure the environmental disruption that would be caused by the material's being processed by a disposal alternative.

2. Operational Rating System

The operational criteria were formulated into an operational rating system. This system was designed independent of any specific material. For each process, mutually exclusive material characteristics that would have direct bearing upon the operation of a specific process were determined. Next, a relative importance factor, expressed as a fraction, was assigned to each characteristic for each process.

3. Environmental Rating System

The environmental criteria were formulated into an environmental rating system. This system was designed independent of a specific material/process. In this system, environmental disruptions were analyzed and relative importance factors based on portions of unity (1.0) were assigned to each environmental impact.

4. Operational and Environmental Rating Definitions

To utilize the aforementioned rating systems, rating and rating code scales ranging in numerical value from 0 to 10 were employed. In each system, 0 stands for unsatisfactory and 10 for excellent. Moreover, for each characteristic and environmental impact, definitions

corresponding to each rating and rating code have been developed in order to apply the rating system consistently. Basically, these definitions were used as a guide for classifying the waste packaging material on the basis of either a numerically measurable or clearly defined characteristic.

By way of illustration, Tables 3 and 4 show, respectively, the solid waste operational and environmental rating system; Tables 5 and 6, respectively, depict the solid waste operational and environmental rating definitions. As stated earlier, a complete listing of all tables and a comprehensive definition of these systems can be found in Appendix B.

5. <u>Operational and Environmental Rating Methodology</u>

Each material was rated in accordance with the criteria developed in the rating definitions for both operational characteristics and environmental impacts.

After numerical calculations had been made, a total disposal rating was expressed. The total disposal rating determined the best possible disposal process subject to the constraints of maximization of process utility and minimization of environmental pollution. The Numerical Process Evaluation Matrices, which are the matrices utilized in standardizing the numerical calculations for each packaging material under study, can be found in Appendix C.

After computing the total disposal rating, each process was ranked. The disposal ranking is the assignment of sequential numbers starting with the highest disposal rating (ranked as number 1) and ending with the lowest disposal rating. This ranking shows the facility officer the order in which the disposal alternatives should be utilized.

III. SUMMARY FACT SHEETS

The Summary Fact Sheets contained herein present a disposability ranking and additional details for 104 military packaging materials including 17 liquids (i.e., chemicals) and 87 solids (i.e., glass, metal, paper, plastic, textile, and wood).

To select the disposal process that will result in minimal pollution of the environment, the Summary Fact Sheet section, entitled "Disposal Rating Summary," should be used as a guide. Within this block is the "Total Disposal Ranking," which indicates the relative order for selection of the best method of disposal on the basis of the operational and environmental analysis. The best method is given the ranking of 1. The determination of economic feasibility, which depends on such local factors as availability and efficiency of equipment, transportation costs, market for materials, etc., must be made at the installation level on the basis of a life-cycle cost analysis. The proposed economic analysis methodology is described in Appendix D of this report.

SUMMARY FACT SHEET LIQUID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE NO.	OTHER
	1	C-1	

1	MATERIAL DESCRIPTION	
CATEGORY	CHEMICAL	
NAME	ACETONE	
COMMON NAME (FORM)	ACETONE (LIQUID)	
USES	SOLVENT	
FEDERAL SPECIFICATION NUMBER	O-A-51	
COMPOSITION	CONSTITUENTS	% BY WEIGHT
	CARBON	62.5
	HYDROGEN	10.0
	OXYGEN	27.5

2	CHEMICAL PROPERTIES	
HEALTH	TOXIC HAZARD RATING CODE	1
FIRE	TOXIC HAZARD RATING CODE	3
REACTIVITY	TOXIC HAZARD RATING CODE	0
FLASH POINT	0	°F
IGNITION TEMPERATURE	1000	°F
BOILING POINT	133	°F
MELTING TEMPERATURE	-137	°F
SPECIFIC GRAVITY	0.79	
EXPLOSIVE LIMITS	3 - 13	
HEAT OF COMBUSTION	-	BTU/LB.
VAPOR DENSITY (AIR = 1)	2.0	
SOLUBILITY IN WATER	SL. SOLUBLE	

3 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	NOTES	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
RECOVERY/REUSE		8.5	8.0	6.3	1	
SANITARY LANDFILL		4.3	5.2	4.8	3	
INCINERATION		8.0	8.4	7.2	2	
SEA DISPOSAL		4.6	2.2	3.4	5	
MICROBIAL TREATMENT		5.1	2.2	2.7	4	

NOTES:

4* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

MCA LABEL. ELIMINATE ALL SOURCES OF IGNITION AND FLAMMABLES. WEAR RUBBER GLOVES, FACE SHIELD, LABORATORY COAT. HAVE ALL-PURPOSE CANISTER MASK AVAILABLE.

5 WASTE DISPOSAL METHOD FOR SMALL SPILL

ABSORB ON PAPER. EVAPORATE ON AN IRON PAN IN A FUME HOOD. BURN THE PAPER. OR ATOMIZE THE WASTE INTO AN INCINERATOR.

6 RECOVERY/DISPOSAL METHOD OF HIGHLY HAZARDOUS LIQUIDS IN LARGE QUANTITIES

RECLAIM BY DISTILLATION. INCINERATE RESIDUE.

7* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET LIQUID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE NO.	OTHER
2	C-2	

1 MATERIAL DESCRIPTION

CATEGORY	CHEMICAL	
NAME	BENZENE	
COMMON NAME (FORM)	BENZOL (LIQUID)	
USES	SOLVENT	
FED/MIL SPECIFICATION NUMBER	VV-B-231	
COMPOSITION	CONSTITUENTS	% BY WEIGHT
	CARBON	92.0
	HYDROGEN	8.0

2 CHEMICAL PROPERTIES

HEALTH	TOXIC HAZARD RATING CODE	2
FIRE	TOXIC HAZARD RATING CODE	3
REACTIVITY	TOXIC HAZARD RATING CODE	0
FLASH POINT	12 °F	
IGNITION TEMPERATURE	1044 °F	
BOILING POINT	176 °F	
MELTING TEMPERATURE	41 °F	
SPECIFIC GRAVITY	.88	
EXPLOSIVE LIMITS	1.4 - 8	
HEAT OF COMBUSTION	- BTU/LB.	
VAPOR DENSITY (AIR = 1)	2.8	
SOLUBILITY IN WATER	SL. SOLUBLE	

3 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	NOTES	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
RECOVERY/REUSE		8.2	7.6	7.9	1	
SANITARY LANDFILL		5.2	2.8	4.0	4	
INCINERATION		8.2	4.8	6.4	2	
SEA DISPOSAL		6.4	2.8	4.8	3	
MICROBIAL TREATMENT		5.1	2.8	4.0	4	

NOTES:

4* SPECIAL PRECAUTIONS, APPLICABLE REGULATIONS

MCA LABEL. ELIMINATE ALL SOURCES OF IGNITION AND FLAMMABLES. PROVIDE VENTILATION. PROVIDE PERSONAL RESPIRATION FOR EMERGENCY.

5 WASTE DISPOSAL METHOD FOR SMALL SPILL

ABSORB ON PAPER. EVAPORATE ON AN IRON PAN IN A HOOD. BURN THE PAPER. OR ATOMIZE THE LIQUID WASTE INTO AN INCINERATOR. COMBUSTION MAY BE IMPROVED BY MIXING WITH A MORE FLAMMABLE SOLVENT.

6 RECOVERY/DISPOSAL METHOD OF HIGHLY HAZARDOUS LIQUIDS IN LARGE QUANTITIES

RECOVER BY DISTILLATION, ESPECIALLY IF USED AS A DRY CLEANING SOLVENT. INCINERATE RESIDUE.

7* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
LIQUID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
3	C-3	

1 MATERIAL DESCRIPTION

CATEGORY	CHEMICAL	
NAME	CARBON TETRACHLORIDE	
COMMON NAME (FORM)	CARBON TETRACHLORIDE (LIQUID)	
USES	SOLVENT	
FED/MIL SPECIFICATION NUMBER	-	
COMPOSITION	CONSTITUENTS	% BY WEIGHT
	CARBON	8.2
	CHLORINE	91.8

2 CHEMICAL PROPERTIES

HEALTH	TOXIC HAZARD RATING CODE	3
FIRE	TOXIC HAZARD RATING CODE	0
REACTIVITY	TOXIC HAZARD RATING CODE	0
FLASH POINT	NONE	°F
IGNITION TEMPERATURE	-	°F
BOILING POINT	171	°F
MELTING TEMPERATURE	-9.4	°F
SPECIFIC GRAVITY	1.58	
EXPLOSIVE LIMITS	NONE	
HEAT OF COMBUSTION	37.3 KC/G	BTU/LB.
VAPOR DENSITY (AIR = 1)	5.3	
SOLUBILITY IN WATER	INSOLUBLE	

3 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	NOTES	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
RECOVERY/REUSE		8.7	8.4	8.6	1	
SANITARY LANDFILL		4.5	2.8	3.6	4	
INCINERATION		5.4	6.2	5.8	2	
SEA DISPOSAL		5.7	3.0	4.4	3	
MICROBIAL TREATMENT		2.7	2.8	2.8	5	

NOTES:

4* SPECIAL PRECAUTIONS/APPLICABLE REGULATIONS

MCA WARNING LABEL. PROVIDE VENTILATION. WEAR RUBBER GLOVES, SELF-CONTAINED RESPIRATOR (OR WORK IN HOOD), LABORATORY COAT. NEVER USE CONTAMINATED DRUMS. FOLLOW PROCEDURES FOR HANDLING OF SPILLS FOR CONTAINER CONTAMINATION.

5 WASTE DISPOSAL METHOD FOR SMALL SPILL

ABSORB ON PAPER TOWELS AND ALLOW TO EVAPORATE IN THE FUME HOOD. BURN THE PAPER. WASH SITE WITH SOAP SOLUTION.

6 RECOVERY/DISPOSAL METHOD OF HIGHLY HAZARDOUS LIQUIDS IN LARGE QUANTITIES

CONTAMINATED THROUGH USE: PURIFY BY DISTILLATION, PLACE THE PURE DISTILLATE BACK ON THE SHELF. THE SLUDGE REMAINING MAY BE INCINERATED OR DISPOSED OF IN SANITARY LANDFILL OR INCINERATE WITH SUPPLEMENTARY FUEL IN FUEL-RICH MIXTURE.

7* NOTES AND COMMENTS

1. NOT CORROSIVE OR DANGEROUSLY REACTIVE, BUT TOXIC BY INHALATION, BY PROLONGED OR REPEATED CONTACT WITH THE SKIN, OR MUCOUS MEMBRANE, OR WHEN INGESTED BY MOUTH.
2. DANGEROUS WHEN HEATED TO DECOMPOSITION. EMITS HIGHLY TOXIC FUMES OF CHLORIDES.
3. REPROCESSING EQUIPMENT IS NORMALLY INTEGRAL WITH USE MACHINERY.

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET LIQUID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	4	C-4	

1 MATERIAL DESCRIPTION

CATEGORY	CHEMICAL
NAME	CORROSION PREVENTIVE
COMMON NAME (FORM)	CORROSION PREVENTIVE (FLUID)
USES	PRESERVATIVE
FED/MIL SPECIFICATION NUMBER	MIL-C-6529 MIL-C-61304 MIL-C-15074 MIL-C-11796 MIL-C-16173

COMPOSITION	CONSTITUENTS	% BY WEIGHT
	PETROLEUM SOLVENT	
	NONVOLITILE BASE	

2 CHEMICAL PROPERTIES

HEALTH	TOXIC HAZARD RATING CODE
FIRE	TOXIC HAZARD RATING CODE
REACTIVITY	TOXIC HAZARD RATING CODE
FLASH POINT	100 °F
IGNITION TEMPERATURE	450 - 500 °F
BOILING POINT	220 - 310 °F
MELTING TEMPERATURE	-40 °F
SPECIFIC GRAVITY	.659 - .970
EXPLOSIVE LIMITS	1 - 5%
HEAT OF COMBUSTION	15,000 BTU/LB.
VAPOR DENSITY (AIR = 1)	N/A
SOLUBILITY IN WATER	INSOLUBLE

3 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	NOTES	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
RECOVERY/REUSE		5.5	7.6	6.6	2	
SANITARY LANDFILL		3.8	2.8	3.3	5	
INCINERATION		8.1	7.0	7.6	1	
SEA DISPOSAL		5.0	3.0	4.0	3	
MICROBIAL TREATMENT		3.5	3.2	3.4	4	

NOTES:

4* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

AGITATE WELL BEFORE USING. CONTAINS COMBUSTIBLE PETROLEUM THINNERS OF 100°F MINIMUM FLASH POINT. AVOID USE NEAR OPEN FLAMES, SPARKS, OR WELDING OR CUTTING OPERATIONS. AVOID PROLONGED OR REPEATED CONTACT WITH THE SKIN, OR BREATHING OF VAPORS. USE PROTECTIVE CLOTHING AND PROPER MASKS FOR PROLONGED EXPOSURES.

5 WASTE DISPOSAL METHOD FOR SMALL SPILL

ABSORB ON PAPER. EVAPORATE ON AN IRON PAN IN A HOOD AND BURN THE PAPER. OR ATOMIZE THE LIQUID WASTE INTO AN INCINERATOR. COMBUSTION MAY BE IMPROVED BY MIXING WITH A MORE FLAMMABLE SOLVENT.

6 RECOVERY/DISPOSAL METHOD OF HIGHLY HAZARDOUS LIQUIDS IN LARGE QUANTITIES

IF A LARGE SPILL, FILTER OR CENTRIFUGE TO REMOVE CONTAMINATES (DIRT) AND USE IMMEDIATELY. OR RETURN TO SUPPLIER FOR REFORMULATION. INCINERATE RESIDUE OR CONTAMINATED MATERIAL.

7* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET LIQUID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE NO.	OTHER
	5	C-5	

1 MATERIAL DESCRIPTION		
CATEGORY	CHEMICAL	
NAME	CORROSION PREVENTIVE	
COMMON NAME (FORM)	DESSICANT (POWDER)	
USES	DEHYDRATING AGENT	
FED/MIL SPECIFICATION NUMBER	MIL-D-3464	
COMPOSITION	CONSTITUENTS	% BY WEIGHT
	CALCIUM COMPOUNDS AND/OR SILICATES	

2 CHEMICAL PROPERTIES			
HEALTH	TOXIC HAZARD RATING CODE	2	
FIRE	TOXIC HAZARD RATING CODE	-	
REACTIVITY	TOXIC HAZARD RATING CODE	-	
FLASH POINT	-		°F
IGNITION TEMPERATURE	-		°F
BOILING POINT	600		°F
MELTING TEMPERATURE	400-600		°F
SPECIFIC GRAVITY	0.65 - 0.95		
EXPLOSIVE LIMITS	-		
HEAT OF COMBUSTION	-		BTU/LB.
VAPOR DENSITY (AIR = 1)	-		
SOLUBILITY IN WATER	INSOLUBLE		

3 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	NOTES	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
RECOVERY/REUSE		8.5	8.4	8.5	1	
SANITARY LANDFILL		6.9	7.6	7.3	2	
INCINERATION		4.1	7.2	5.7	5	
SEA DISPOSAL		6.0	7.8	6.6	3	
MICROBIAL TREATMENT		5.6	7.6	6.6	4	

NOTES:

4* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

5 WASTE DISPOSAL METHOD FOR SMALL SPILL

IF LESS THAN 1 KILOGRAM OF LOOSE MATERIAL, COLLECT AND DISPOSE BY SANITARY LANDFILL. DISPOSE OF DESSICANT BAGS (1) FROM NON-RETURNABLE CONTAINERS IN SANITARY LANDFILL.

6 RECOVERY/DISPOSAL METHOD OF HIGHLY HAZARDOUS LIQUIDS IN LARGE QUANTITIES

SEGREGATE DEBRIS FROM CHEMICAL. REBAG (1) IF LOOSE AND CHEMICAL CAN BE USED ON SITE. MAINTAIN DESSICANT BAGS (1) WITH ALL RETURNABLE CONTAINERS AND RETURN BAGS WITH CONTAINER.

7* NOTES AND COMMENTS

(1)CHEMICAL IS NORMALLY USED IN CLOTH BAGS TO MAINTAIN DRY ENVIRONMENT DURING STORAGE AND TRANSPORT OF PRESERVED ARTICLE.

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET LIQUID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER:
	6	C-6	

1 MATERIAL DESCRIPTION		
CATEGORY	CHEMICAL	
NAME	CORROSION PREVENTIVE	
COMMON NAME (FORM)	OIL TYPE VCI (FLUID)	
USES	PRESERVATIVE	
FED/MIL SPECIFICATION NUMBER	MIL-I-23310	
COMPOSITION	CONSTITUENTS	% BY WEIGHT

2 CHEMICAL PROPERTIES	
HEALTH	TOXIC HAZARD RATING CODE -
FIRE	TOXIC HAZARD RATING CODE -
REACTIVITY	TOXIC HAZARD RATING CODE -
FLASH POINT	100 °F
IGNITION TEMPERATURE	450 - 500 °F
BOILING POINT	220 - 310 °F
MELTING TEMPERATURE	-40 °F
SPECIFIC GRAVITY	0.659 - 0.970
EXPLOSIVE LIMITS	1 - 5%
HEAT OF COMBUSTION	15,000 BTU/LB.
VAPOR DENSITY (AIR = 1)	N/A
SOLUBILITY IN WATER	INSOLUBLE

3 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	NOTES	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
RECOVERY/REUSE		5.5	7.2	6.4	2	
SANITARY LANDFILL		4.6	6.0	5.3	5	
INCINERATION		7.9	6.4	7.2	1	
SEA DISPOSAL		5.2	6.0	5.6	3	
MICROBIAL TREATMENT		4.6	6.2	5.4	4	

NOTES:

4* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

ELIMINATE ALL SOURCES OF IGNITION. AVOID LONG OR REPEATED CONTACT WITH CHEMICAL OR VAPOR. USE PROTECTIVE MASK AND CLOTHING FOR PROLONGED EXPOSURE.

5 WASTE DISPOSAL METHOD FOR SMALL SPILL

ABSORB ON PAPER. EVAPORATE IN FUME HOOD. INCINERATE THE PAPER, OR ATOMIZE LIQUID WASTE INTO AN INCINERATOR. COMBUSTION MAY BE IMPROVED BY MIXING WITH A MORE FLAMMABLE SOLVENT.

6 RECOVERY/DISPOSAL METHOD OF HIGHLY HAZARDOUS LIQUIDS IN LARGE QUANTITIES

COLLECT AND RETURN TO SUPPLIER FOR REPROCESSING AND REFORMULATION OR INCINERATE AND DISPOSE OF INCINERATOR RESIDUE BY SANITARY LANDFILL.

7* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET LIQUID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	7	C-7	

1 MATERIAL DESCRIPTION			
CATEGORY	CHEMICAL		
NAME	CORROSION PREVENTIVE		
COMMON NAME (FORM)	VCI (SOLID)		
USES	PRESERVATIVE		
FED/MIL SPECIFICATION NUMBER	MIL-I-22110		
COMPOSITION	CONSTITUENTS	% BY WEIGHT	

2 CHEMICAL PROPERTIES		
HEALTH	TOXIC HAZARD RATING CODE	-
FIRE	TOXIC HAZARD RATING CODE	-
REACTIVITY	TOXIC HAZARD RATING CODE	-
FLASH POINT	150	°F
IGNITION TEMPERATURE	550 - 600	°F
BOILING POINT	300	°F
MELTING TEMPERATURE	100	°F
SPECIFIC GRAVITY	0.7 - 0.9	
EXPLOSIVE LIMITS	1 - 5%	
HEAT OF COMBUSTION	16,000	BTU/LB.
VAPOR DENSITY (AIR = 1)	N/A	
SOLUBILITY IN WATER	INSOLUBLE	

3 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	NOTES	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
RECOVERY/REUSE		5.5	7.0	6.3	2	
SANITARY LANDFILL		4.6	6.0	5.3	4	
INCINERATION		7.9	6.6	7.3	1	
SEA DISPOSAL		4.6	6.2	5.4	3	
MICROBIAL TREATMENT		4.3	6.4	5.4	4	

NOTES:

4* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

ELIMINATE ALL SOURCES OF IGNITION. AVOID LONG OR REPEATED CONTACT WITH CHEMICAL OR VAPOR. USE PROTECTIVE MASK AND CLOTHING FOR PROLONGED EXPOSURE.

5 WASTE DISPOSAL METHOD FOR SMALL SPILL

COLLECT AND INCINERATE. DISPOSE OF INCINERATED RESIDUE IN SANITARY LANDFILL.

6 RECOVERY/DISPOSAL METHOD OF HIGHLY HAZARDOUS LIQUIDS IN LARGE QUANTITIES

COLLECT AND RETURN TO SUPPLIER FOR REPROCESSING AND REFORMULATION OR INCINERATE AND DISPOSE OF INCINERATOR RESIDUE BY SANITARY LANDFILL.

7* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
LIQUID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
8	C-8	

1 MATERIAL DESCRIPTION

CATEGORY	CHEMICAL
NAME	DETERGENT
COMMON NAME (FORM)	ALKALI CLEANING COMPOUND (LIQUID)
USES	DETERGENT
FED/MIL SPECIFICATION NUMBER	P-C-436
COMPOSITION	CONSTITUENTS / % BY WEIGHT

2 CHEMICAL PROPERTIES

HEALTH	TOXIC HAZARD RATING CODE	2
FIRE	TOXIC HAZARD RATING CODE	-
REACTIVITY	TOXIC HAZARD RATING CODE	-
FLASH POINT	350	°F
IGNITION TEMPERATURE	600	°F
BOILING POINT	220 - 250	°F
MELTING TEMPERATURE	10	°F
SPECIFIC GRAVITY	1.020 - 1.050	
EXPLOSIVE LIMITS	-	
HEAT OF COMBUSTION	-	BTU/LB.
VAPOR DENSITY (AIR = 1)	-	
SOLUBILITY IN WATER	INFINITE	

3 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	NOTES	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
RECOVERY/REUSE		8.5	7.8	8.1	1	
SANITARY LANDFILL		7.3	6.6	7.0	2	
INCINERATION		5.3	5.0	5.2	5	
SEA DISPOSAL		7.2	4.4	5.8	4	
MICROBIAL TREATMENT		6.6	6.0	6.3	3	

NOTES:

4* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

DO NOT TAKE INTERNALLY. KEEP OUT OF EYES. IF SWALLOWED INDUCE VOMITING AND FLUSH WITH WATER. EXTERNAL CONTACT - FLUSH WITH WATER. CALL PHYSICIAN.

5 WASTE DISPOSAL METHOD FOR SMALL SPILL

IF LESS THAN 1 LITER NEUTRALIZE AND MOP UP DISCHARGE INTO SANITARY SEWER WITH LARGE EXCESS OF WATER.

6 RECOVERY/DISPOSAL METHOD OF HIGHLY HAZARDOUS LIQUIDS IN LARGE QUANTITIES

IF A LARGE SPILL, COLLECT MATERIAL AND USE IMMEDIATELY. NEUTRALIZE REMAINING MATERIAL, FLUSH AREA WITH WATER, AND ALLOW WATER TO FLOW INTO SANITARY SEWER.

7* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
LIQUID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
9	C-9	

1 MATERIAL DESCRIPTION

CATEGORY	CHEMICAL	
NAME	DETERGENT	
COMMON NAME (FORM)	DETERGENT (LIQUID)	
USES	DETERGENT	
FED/MIL SPECIFICATION NUMBER	MIL-D-18791	
COMPOSITION	CONSTITUENTS	% BY WEIGHT
	NONIONIC SURFACE ACTIVE AGENT (TYPE I)	99.0

2 CHEMICAL PROPERTIES

HEALTH	TOXIC HAZARD RATING CODE	
FIRE	TOXIC HAZARD RATING CODE	
REACTIVITY	TOXIC HAZARD RATING CODE	
FLASH POINT	350	°F
IGNITION TEMPERATURE	800	°F
BOILING POINT	430 - 480	°F
MELTING TEMPERATURE	32	°
SPECIFIC GRAVITY	1.07	
EXPLOSIVE LIMITS	N/A	
HEAT OF COMBUSTION	-	BTU/LB.
VAPOR DENSITY (AIR = 1)	N/A	
SOLUBILITY IN WATER	INFINITE	

3 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	NOTES	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
RECOVERY/REUSE		6.5	7.4	7.0	2	
SANITARY LANDFILL		8.0	5.2	6.6	3	
INCINERATION		5.3	5.0	5.2	5	
SEA DISPOSAL		7.6	4.8	6.2	4	
MICROBIAL TREATMENT		8.0	8.4	7.2	1	

NOTES:

4* SPECIAL PRECAUTIONS/APPLICABLE REGULATIONS

DO NOT TAKE INTERNALLY. KEEP OUT OF EYES. IF SWALLOWED, INDUCE VOMITING AND CALL A PHYSICIAN. FOR EYES, FLUSH WITH PLENTY OF WATER AND GET MEDICAL ATTENTION.

5 WASTE DISPOSAL METHOD FOR SMALL SPILL

NEUTRALIZE AND MOP UP OR USE WATER-VAC. DISCHARGE TO SEWER WITH LARGE EXCESS OF WATER.

6 RECOVERY/DISPOSAL METHOD OF HIGHLY HAZARDOUS LIQUIDS IN LARGE QUANTITIES

IF A LARGE SPILL, COLLECT MATERIAL AND USE IMMEDIATELY. FLUSH AREA WITH WATER AND ALLOW WATER TO FLOW INTO A SANITARY SEWER. DILUTE RESIDUE WITH LARGE QUANTITIES OF WATER AND FLUSH INTO SANITARY SEWER.

7* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET LIQUID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	10	C-10	

1	MATERIAL DESCRIPTION	
CATEGORY	CHEMICAL	
NAME	GREASE	
COMMON NAME (FORM)	GREASE (FLUID)	
USES	PRESERVATIVE	
FED/MIL SPECIFICATION NUMBER	MIL-G-7711 MIL-G-10924 MIL-G-23827	
COMPOSITION	CONSTITUENTS	% BY WEIGHT

2	CHEMICAL PROPERTIES	
HEALTH	TOXIC HAZARD RATING CODE	
FIRE	TOXIC HAZARD RATING CODE	
REACTIVITY	TOXIC HAZARD RATING CODE	
FLASH POINT	400 - 500	°F
IGNITION TEMPERATURE	700	°F
BOILING POINT	N/A	°F
MELTING TEMPERATURE	LESS THAN -40	°F
SPECIFIC GRAVITY	.65 - .82	
EXPLOSIVE LIMITS	N/A	
HEAT OF COMBUSTION	18,800 - 20,000	BTU/LB.
VAPOR DENSITY (AIR = 1)	N/A	
SOLUBILITY IN WATER	INSOLUBLE	

3 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	NOTES	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
RECOVERY/ REUSE		5.0	7.8	6.4	2	
SANITARY LANDFILL		4.2	3.2	3.7	4	
INCINERATION		8.6	5.4	7.0	1	
SEA DISPOSAL		5.8	2.0	3.9	3	
MICROBIAL TREATMENT		4.9	2.0	3.5	5	

NOTES:

4* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

ELIMINATE ALL SOURCES OF IGNITION AND FLAMMABLES.

5 WASTE DISPOSAL METHOD FOR SMALL SPILL

MAKE UP PACKAGES IN PAPER OR OTHER FLAMMABLE MATERIAL. BURN IN THE INCINERATOR. OR THE SOLID MAY BE DISSOLVED IN A FLAMMABLE SOLVENT AND SPRAYED INTO THE FIRE CHAMBER.

6 RECOVERY/DISPOSAL METHOD OF HIGHLY HAZARDOUS LIQUIDS IN LARGE QUANTITIES

IF A LARGE SPILL, COLLECT UNCONTAMINATED MATERIAL AND USE IMMEDIATELY. INCINERATE RESIDUE OR CONTAMINATED MATERIAL.

7* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET LIQUID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE NO.	OTHER
	11	C-11	

1 MATERIAL DESCRIPTION

CATEGORY	CHEMICAL
NAME	LUBRICATING OIL
COMMON NAME (FORM)	LUBRICATING OIL (LIQUID)
USES	PRESERVATIVE
FED/MIL SPECIFICATION NUMBER	VV-L-800 MIL-L-3150

COMPOSITION	CONSTITUENTS	% BY WEIGHT
	PETROLEUM FRACTION	

2 CHEMICAL PROPERTIES

HEALTH	TOXIC HAZARD RATING CODE	
FIRE	TOXIC HAZARD RATING CODE	
REACTIVITY	TOXIC HAZARD RATING CODE	
FLASH POINT	275	°F
IGNITION TEMPERATURE	500	°F
BOILING POINT	250 - 300	°F
MELTING TEMPERATURE	-20	°F
SPECIFIC GRAVITY	0.75 - 0.88	
EXPLOSIVE LIMITS	N/A	
HEAT OF COMBUSTION	-	BTU/LB.
VAPOR DENSITY (AIR = 1)	N/A	
SOLUBILITY IN WATER	INSOLUBLE	

3 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	NOTES	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
RECOVERY/REUSE		5.0	7.8	6.4	2	
SANITARY LANDFILL		4.2	3.2	3.7	4	
INCINERATION		8.6	5.4	7.0	1	
SEA DISPOSAL		5.8	2.0	3.9	3	
MICROBIAL TREATMENT		4.9	2.0	3.5	5	

NOTES:

4* SPECIAL PRECAUTIONS/APPLICABLE REGULATIONS

ELIMINATE ALL SOURCES OF IGNITION AND FLAMMABLES.

5 WASTE DISPOSAL METHOD FOR SMALL SPILL

ATOMIZE INTO AN INCINERATOR. COMBUSTION MAY BE IMPROVED BY MIXING WITH A MORE FLAMMABLE SOLVENT.

6 RECOVERY/DISPOSAL METHOD OF HIGHLY HAZARDOUS LIQUIDS IN LARGE QUANTITIES

COLLECT AND MARK FOR REFORMULATION BY SUPPLIER IF AVAILABLE, OTHERWISE DISPOSE OF BY INCINERATION:

7* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET LIQUID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	12	C-12	

1	MATERIAL DESCRIPTION	
CATEGORY	CHEMICAL	
NAME	METHANOL	
COMMON NAME (FORM)	WOOD ALCOHOL (LIQUID)	
USES	SOLVENT	
FED/MIL SPECIFICATION NUMBER	O-M-232	
COMPOSITION	CONSTITUENTS	% BY WEIGHT
	CARBON	37.5
	OXYGEN	50.0
	HYDROGEN	12.5

2	CHEMICAL PROPERTIES	
HEALTH	TOXIC HAZARD RATING CODE	I
FIRE	TOXIC HAZARD RATING CODE	3
REACTIVITY	TOXIC HAZARD RATING CODE	0
FLASH POINT	12	°F
IGNITION TEMPERATURE	667	°F
BOILING POINT	149	°F
MELTING TEMPERATURE	-144	°F
SPECIFIC GRAVITY	.79	
EXPLOSIVE LIMITS	6 - 36.5	
HEAT OF COMBUSTION	-	BTU/LB.
VAPOR DENSITY (AIR = 1)	1.11	
SOLUBILITY IN WATER	-	

3 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	NOTES	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
RECOVERY/REUSE		6.6	6.4	7.5	1	
SANITARY LANDFILL		5.2	3.6	4.4	4	
INCINERATION		6.0	6.2	7.1	2	
SEA DISPOSAL		6.7	2.6	4.6	3	
MICROBIAL TREATMENT		3.6	2.8	3.2	5	

NOTES:

4* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

MCA LABEL. ELIMINATE ALL SOURCES OF IGNITION. WEAR RUBBER GLOVES, FACE SHIELD, LABORATORY COAT. HAVE ALL-PURPOSE CANISTER MASK AVAILABLE. ELIMINATE ALL SOURCES OF FLAMMABLES.

5 WASTE DISPOSAL METHOD FOR SMALL SPILL

ABSORB ON PAPER. EVAPORATE ON AN IRON PAN IN A FUME HOOD. BURN THE PAPER.

6 RECOVERY/DISPOSAL METHOD OF HIGHLY HAZARDOUS LIQUIDS IN LARGE QUANTITIES

PURIFY BY DISTILLATION OR ATOMIZE AND BURN IN AN INCINERATOR. INCINERATE DISTILLATION RESIDUE. COMBUSTION MAY BE IMPROVED BY MIXING WITH A MORE FLAMMABLE SOLVENT.

7* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET LIQUID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	13	C-13	

1	MATERIAL DESCRIPTION		2	CHEMICAL PROPERTIES	
CATEGORY	CHEMICAL		HEALTH	TOXIC HAZARD RATING CODE	
NAME	PETROLATUM		FIRE	TOXIC HAZARD RATING CODE	
COMMON NAME (FORM)	PETROLATUM (LIQUID)		REACTIVITY	TOXIC HAZARD RATING CODE	
USES	PRESERVATIVE		FLASH POINT	100	°F
FED/MIL SPECIFICATION NUMBER	MIL-C-10382		IGNITION TEMPERATURE	450	°F
COMPOSITION	CONSTITUENTS	% BY WEIGHT	BOILING POINT	300 - 400	°F
	PETROLATUM LANOLIN	31.0 10.5	MELTING TEMPERATURE	150 - 170	°F
			SPECIFIC GRAVITY	0.9 - 1.0	
			EXPLOSIVE LIMITS	1 - 6%	
			HEAT OF COMBUSTION	-	BTU/LB.
			VAPOR DENSITY (AIR = 1)	N/A	
			SOLUBILITY IN WATER	INSOLUBLE	

3 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	NOTES	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
RECOVERY/REUSE		5.0	7.8	6.4	2	
SANITARY LANDFILL		4.2	3.2	3.7	4	
INCINERATION		8.6	5.4	7.0	1	
SEA DISPOSAL		5.8	2.0	3.9	3	
MICROBIAL TREATMENT		4.9	2.0	3.5	5	

NOTES:

4* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

USE ONLY FOR CORROSION PREVENTION DURING STORAGE. REMOVE THE PREVENTIVE FROM FOOD HANDLING EQUIPMENT AND MACHINERY BEFORE OPERATING BY FLUSHING WITH HOT WATER (106°F). ELIMINATE ALL SOURCES OF IGNITION AND FLAMMABLES.

5 WASTE DISPOSAL METHOD FOR SMALL SPILL

SWEEP ONTO PAPER AND PLACE IN AN IRON PAN IN THE HOOD. BURN THE PAPER AND COMPOUND. OR MAKE UP PACKAGES IN PAPER OR OTHER FLAMMABLE MATERIAL. BURN IN THE INCINERATOR. OR THE SOLID MAY BE DISSOLVED IN A FLAMMABLE SOLVENT AND SPRAYED INTO THE FIRE CHAMBER.

6 RECOVERY/DISPOSAL METHOD OF HIGHLY HAZARDOUS LIQUIDS IN LARGE QUANTITIES

INCINERATE MATERIAL AND DISPOSE OF RESIDUE IN A LANDFILL.

7* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET LIQUID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE NO.	OTHER
	14	C-14	

1 MATERIAL DESCRIPTION	
CATEGORY	CHEMICAL
NAME	PETROLEUM CLEANING SOLVENT
COMMON NAME (FORM)	STODDARD SOLVENT (LIQUID)
USES	SOLVENT
FED/MIL SPECIFICATION NUMBER	P-D-680
COMPOSITION	CONSTITUENTS: PETROLEUM DISTILLATE; % BY WEIGHT:

2 CHEMICAL PROPERTIES		
HEALTH	TOXIC HAZARD RATING CODE	1
FIRE	TOXIC HAZARD RATING CODE	2
REACTIVITY	TOXIC HAZARD RATING CODE	
FLASH POINT	100 °F	
IGNITION TEMPERATURE	441 °F	
BOILING POINT	428 °F	
MELTING TEMPERATURE	- °F	
SPECIFIC GRAVITY	1.0	
EXPLOSIVE LIMITS	8.5	
HEAT OF COMBUSTION	- BTU/LB.	
VAPOR DENSITY (AIR = 1)	-	
SOLUBILITY IN WATER	-	

3 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	NOTES	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
RECOVERY/REUSE		8.2	7.8	7.9	1	
SANITARY LANDFILL		5.2	2.8	4.0	4	
INCINERATION		8.2	4.8	6.4	2	
SEA DISPOSAL		6.4	2.8	4.3	3	
MICROBIAL TREATMENT		5.1	2.8	4.0	4	

NOTES:

4* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

WEAR RUBBER GLOVES, FACE SHIELD, LABORATORY COAT. HAVE ALL-PURPOSE CANISTER MASK AVAILABLE. ELIMINATE ALL SOURCES OF IGNITION AND FLAMMABLES.

5 WASTE DISPOSAL METHOD FOR SMALL SPILL

ABSORB ON PAPER. EVAPORATE ON AN IRON PAN IN A HOOD. BURN THE PAPER. OR ATOMIZE INTO AN INCINERATOR. COMBUSTION MAY BE IMPROVED BY MIXING WITH A MORE FLAMMABLE SOLVENT.

6 RECOVERY/DISPOSAL METHOD OF HIGHLY HAZARDOUS LIQUIDS IN LARGE QUANTITIES

RECLAIM BY DISTILLATION ESPECIALLY IF USED AS A DRY CLEANING SOLVENT. INCINERATE RESIDUE.

7* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET LIQUID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	15	C-15	

1 MATERIAL DESCRIPTION			
CATEGORY	CHEMICAL		
NAME	PETROLEUM DISTILLATE		
COMMON NAME (FORM)	MINERAL SPIRITS (LIQUID)		
USES	SOLVENT		
FED/MIL SPECIFICATION NUMBER	TT-T-291		
COMPOSITION	CONSTITUENTS	% BY WEIGHT	
	AROMATIC COMPOUNDS	8.0	
	ETHYLBENZENE	20.0	

2 CHEMICAL PROPERTIES		
HEALTH	TOXIC HAZARD RATING CODE	
FIRE	TOXIC HAZARD RATING CODE	
REACTIVITY	TOXIC HAZARD RATING CODE	
FLASH POINT	100	°F
IGNITION TEMPERATURE	450 - 500	°F
BOILING POINT	200 - 300	°F
MELTING TEMPERATURE	-50	°F
SPECIFIC GRAVITY	0.865 - 0.970	
EXPLOSIVE LIMITS	1 - 6%	
HEAT OF COMBUSTION	-	BTU/LB.
VAPOR DENSITY (AIR = 1)	N/A	
SOLUBILITY IN WATER	INSOLUBLE	

3 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	NOTES	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
RECOVERY/REUSE		7.8	7.2	7.5	1	
SANITARY LANDFILL		4.0	4.0	4.0	5	
INCINERATION		7.1	4.6	5.9	2	
SEA DISPOSAL		4.9	[illegible]	4.5	3	
MICROBIAL TREATMENT		4.6	3.6	4.1	4	

NOTES:

4* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

WEAR RUBBER GLOVES, FACE SHIELD, LABORATORY COAT. HAVE ALL-PURPOSE CANISTER MASK AVAILABLE. ELIMINATE ALL SOURCES OF IGNITION AND FLAMMABLES.

5 WASTE DISPOSAL METHOD FOR SMALL SPILL

ABSORB ON PAPER. EVAPORATE ON AN IRON PAN IN A HOOD. BURN THE PAPER. OR ATOMIZE INTO AN INCINERATOR. COMBUSTION MAY BE IMPROVED BY MIXING WITH A MORE FLAMMABLE SOLVENT.

6 RECOVERY/DISPOSAL METHOD OF HIGHLY HAZARDOUS LIQUIDS IN LARGE QUANTITIES

RECOVER BY DISTILLATION. INCINERATE RESIDUE. RECOVERED THINNER MAY NOT BE SUITABLE FOR HIGH QUALITY PAINTS WHERE COLOR IS CRITICAL.

7* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET LIQUID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE NO.	OTHER
	16	C-16	

1 MATERIAL DESCRIPTION

CATEGORY	CHEMICAL
NAME	TETRACHLOROETHYLENE
COMMON NAME (FORM)	PERCHLOROETHYLENE (LIQUID)
USES	DRY CLEANING SOLVENT DEGREASING SOLVENT
FED/MIL SPECIFICATION NUMBER	MIL-O-T-236

COMPOSITION	CONSTITUENTS	% BY WEIGHT
	CARBON	14.48
	CHLORINE	85.52

2 CHEMICAL PROPERTIES

HEALTH	TOXIC HAZARD RATING CODE	2
FIRE	TOXIC HAZARD RATING CODE	1
REACTIVITY	TOXIC HAZARD RATING CODE	
FLASH POINT	NONE	°F
IGNITION TEMPERATURE	-	°F
BOILING POINT	250	°F
MELTING TEMPERATURE	-11	°F
SPECIFIC GRAVITY	1.62	
EXPLOSIVE LIMITS	-	
HEAT OF COMBUSTION	5400	BTU/LB.
VAPOR DENSITY (AIR = 1)	5.83	
SOLUBILITY IN WATER	INSOLUBLE	

3 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	NOTES	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
RECOVERY/REUSE		8.7	8.0	8.4	1	
SANITARY LANDFILL		4.5	2.6	3.8	4	
INCINERATION	(1)	5.4	5.8	5.6	2	
SEA DISPOSAL		5.7	3.0	4.4	3	
MICROBIAL TREATMENT		2.7	2.8	2.8	5	

NOTES:
(1) INCINERATOR MUST HAVE SUPPLEMENTAL FUEL AND WATER SCRUBBER.

4* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PROVIDE VENTILATION, WEAR RUBBER GLOVES AND LABORATORY COAT, AND PROVIDE PERSONAL RESPIRATOR FOR EMERGENCY. DO NOT REUSE CONTAMINATED DRUMS. FOLLOW PROCEDURES FOR SPILLS TO CLEAN CONTAINERS AND RECYCLE OR DISPOSE OF CONTAINERS IN ACCORDANCE WITH SOLID WASTE PROCEDURES.

5 WASTE DISPOSAL METHOD FOR SMALL SPILL

ABSORB ON PAPER TOWELS AND EVAPORATE IN A FUME HOOD. BURN THE PAPER AND WASH THE SITE WITH A SOAP SOLUTION.

6 RECOVERY/DISPOSAL METHOD OF HIGHLY HAZARDOUS LIQUIDS IN LARGE QUANTITIES

RECOVER BY DISTILLATION. INCINERATE SLUDGE WITH SUPPLEMENTAL FUEL IN FUEL-RICH MIXTURE (2)

7* NOTES AND COMMENTS

(2) FUEL-RICH MIXTURE PERMITS ALL CL TO FORM HCL WHICH CAN BE REMOVED IN A WATER SCRUBBER. A LEAN FUEL MIXTURE PRODUCES CL_2 WHEN TETRACHLOROETHYLENE IS INCINERATED.

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET LIQUID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	17	C-17	

1 MATERIAL DESCRIPTION

CATEGORY	CHEMICAL
NAME	TRICHLOROETHYLENE
COMMON NAME (FORM)	PERCHLOROETHYLENE (LIQUID)
USES	DRY CLEANING SOLVENT DEGREASER
FED/MIL SPECIFICATION NUMBER	MIL-O-T-634

COMPOSITION	CONSTITUENTS	% BY WEIGHT
	CARBON	
	HYDROGEN	
	CHLORINE	

2 CHEMICAL PROPERTIES

HEALTH	TOXIC HAZARD RATING CODE	2
FIRE	TOXIC HAZARD RATING CODE	1
REACTIVITY	TOXIC HAZARD RATING CODE	
FLASH POINT	NONE °F	
IGNITION TEMPERATURE	770 °F	
BOILING POINT	190 °F	
MELTING TEMPERATURE	-99C °F	
SPECIFIC GRAVITY	1.456	
EXPLOSIVE LIMITS	NONE	
HEAT OF COMBUSTION	280 KC/G BTU/LB.	
VAPOR DENSITY (AIR = 1)	4.53	
SOLUBILITY IN WATER	INSOLUBLE	

3 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	NOTES	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
RECOVERY/REUSE		8.7	8.0	8.4	1	
SANITARY LANDFILL		4.5	2.8	3.6	4	
INCINERATION	(1)	5.4	5.8	5.6	2	
SEA DISPOSAL		5.7	3.0	4.4	3	
MICROBIAL TREATMENT		2.7	2.6	2.8	5	

NOTES:
(1) INCINERATOR MUST HAVE SUPPLEMENTAL FUEL AND WATER SCRUBBER.

4* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PROVIDE VENTILATION, WEAR RUBBER GLOVES AND LABORATORY COAT, AND PROVIDE PERSONAL RESPIRATOR FOR EMERGENCY. DO NOT REUSE CONTAMINATED DRUMS. FOLLOW PROCEDURES FOR SPILLS TO CLEAN CONTAINERS AND RECYCLE OR DISPOSE OF CONTAINERS IN ACCORDANCE WITH SOLID WASTE PROCEDURES.

5 WASTE DISPOSAL METHOD FOR SMALL SPILL

ABSORB ON PAPER TOWELS AND EVAPORATE IN A FUME HOOD. BURN THE PAPER AND WASH THE SITE WITH A SOAP SOLUTION.

6 RECOVERY/DISPOSAL METHOD OF HIGHLY HAZARDOUS LIQUIDS IN LARGE QUANTITIES

RECOVER BY DISTILLATION. INCINERATE SLUDGE WITH SUPPLEMENTAL FUEL AND FUEL-RICH MIXTURE.(2)

7* NOTES AND COMMENTS

(2) A FUEL-RICH MIXTURE PERMITS ALL CL TO FORM HCL WHICH CAN BE REMOVED IN A WATER SCRUBBER. A LEAN FUEL MIXTURE PRODUCES CL_2 WHEN TRICHLOROETHYLENE IS INCINERATED.

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
18	C-18	

1 MATERIAL DESCRIPTION

CATEGORY	GLASS
NAME	GLASS
COMMON NAME (FORM)	FIBERGLASS(FIBER)
USES	CUSHIONING
FEDERAL/ MILITARY SPECIFICATION NUMBER	MIL-C-17435
COMPOSITION	SODA-LIME-SILICA

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	1500 °F
COMBUSTION TEMPERATURE	- °F
HEAT OF COMBUSTION	- BTU/LB
MATERIAL DENSITY	156 LB/CU.FT.
BULK DENSITY	156 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	UNSATISFACTORY
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	POOR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	3.0	10.0	6.5	3	
RECYCLE	A B	2.4	9.0	5.7	5	
PYROLYSIS	A	3.0	8.2	5.6	6	
COMPOSTING	A	3.6	8.2	6.0	4	
BALING	B	5.6	8.2	7.0	2	
INCINERATION	A	3.3	6.8	5.1	7	
SANITARY LANDFILL	B	7.6	7.8	7.7	1	
SEA DISPOSAL	B	5.6	4.6	5.1	7	

PRE-PROCESSES
A - SEPARATION
B - COMPACTION
C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
19	C-19	

1 MATERIAL DESCRIPTION

CATEGORY	GLASS
NAME	GLASS/PLASTIC
COMMON NAME (FORM)	FIBERGLASS (SHEET)
USES	CONTAINERS, TRAYS
FEDERAL/ MILITARY SPECIFICATION NUMBER	MIL-T-43259
COMPOSITION	SODA, LIME, SILICA, WITH PLASTIC LAMINATION

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	1500	°F
COMBUSTION TEMPERATURE	-	°F
HEAT OF COMBUSTION	-	BTU/LB
MATERIAL DENSITY	156	LB/CU.FT.
BULK DENSITY	156	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	POOR
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	UNSATISFACTORY
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	GOOD

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	5.0	10.0	7.5	1	
RECYCLE	A B	2.4	9.0	5.7	4	
PYROLYSIS	A C	2.4	8.2	5.3	5	
COMPOSTING	A C	3.2	8.2	5.7	4	
BALING	B	5.8	8.2	7.0	3	
INCINERATION	A C	2.7	6.8	4.8	7	
SANITARY LANDFILL	B	7.0	7.8	7.4	2	
SEA DISPOSAL	B	5.6	4.6	5.1	6	

PRE-PROCESSES: A - SEPARATION, B - COMPACTION, C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
20	C-20	

1 MATERIAL DESCRIPTION

CATEGORY	GLASS
NAME	GLASS
COMMON NAME (FORM)	GLASS (SOLID STOCK)
USES	CONTAINERS
FEDERAL/MILITARY SPECIFICATION NUMBER	-
COMPOSITION	SODA-LIME-SILICA

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	2282-2732	°F
COMBUSTION TEMPERATURE	-	°F
HEAT OF COMBUSTION	-	BTU/LB
MATERIAL DENSITY	156	LB/CU.FT.
BULK DENSITY	45	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	GOOD
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	UNSATISFACTORY
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	UNSATISFACTORY
CHEMICAL DEGRADABILITY	UNSATISFACTORY
REUSABILITY	EXCELLENT

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	8.5	10.0	9.3	1	
RECYCLE	A B	6.6	9.0	7.9	2	
PYROLYSIS	A C	3.6	6.2	5.9	6	
COMPOSTING	A C	4.4	8.2	6.3	5	
BALING	B	6.4	8.2	7.3	4	
INCINERATION	A C	3.4	6.6	5.1	7	
SANITARY LANDFILL	B	7.4	7.6	7.6	3	
SEA DISPOSAL	B	5.6	4.6	5.1	7	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	21	C-21	

1 MATERIAL DESCRIPTION

CATEGORY	GLASS
NAME	MINERAL
COMMON NAME (FORM)	VERMICULITE (FIBER)
USES	CUSHIONING
FEDERAL/MILITARY SPECIFICATION NUMBER	MIL-V-21626 MIL-V-23776
COMPOSITION	EXPANDED FORM OF MICA

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	2200-2400	°F
COMBUSTION TEMPERATURE	-	°F
HEAT OF COMBUSTION	-	BTU/LB
MATERIAL DENSITY	4-9	LB/CU.FT.
BULK DENSITY	4-9	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	UNSATISFACTORY
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	UNSATISFACTORY
CHEMICAL DEGRADABILITY	UNSATISFACTORY
REUSABILITY	FAIR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	4.0	10.0	7.0	2	
RECYCLE	A B	4.8	9.0	6.9	3	
PYROLYSIS	A	2.4	8.2	5.3	6	
COMPOSTING	A	2.6	8.2	5.4	5	
BALING	B	6.8	8.2	7.5	1	
INCINERATION	A	3.7	8.8	5.3	6	
SANITARY LANDFILL	B	5.4	7.8	6.6	4	
SEA DISPOSAL	B	3.4	4.6	4.0	7	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
22	C-22	

1 MATERIAL DESCRIPTION

CATEGORY	METAL
NAME	ALUMINUM
COMMON NAME (FORM)	ALUMINUM (FOIL)
USES	TRAYS, WRAPPING
FEDERAL/ MILITARY SPECIFICATION NUMBER	MIL-A-146
COMPOSITION	NOT LESS THEN 99% UNCOATED ALUMINUM

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	700	°F
COMBUSTION TEMPERATURE	-	°F
HEAT OF COMBUSTION	-	BTU/LB
MATERIAL DENSITY	169	LB/CU.FT.
BULK DENSITY	169	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	POOR
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	UNSATISFACTORY
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	UNSATISFACTORY
CHEMICAL DEGRADABILITY	UNSATISFACTORY
REUSABILITY	POOR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	3.5	10.0	6.6	4	
RECYCLE	A B	6.6	9.0	7.9	1	
PYROLYSIS	A C	3.0	7.4	5.2	5	
COMPOSTING	A C	2.6	7.4	5.0	6	
BALING	B	6.4	7.4	6.9	3	
INCINERATION	A C	4.0	6.0	5.0	6	
SANITARY LANDFILL	B	7.4	6.6	7.1	2	
SEA DISPOSAL	B	5.6	3.8	4.7	7	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	23	C-23	

1 MATERIAL DESCRIPTION

CATEGORY	METAL
NAME	ALUMINUM
COMMON NAME (FORM)	ALUMINUM (SHEET)
USES	CANS, TUBES
FEDERAL/ MILITARY SPECIFICATION NUMBER	QQ-A-250
COMPOSITION	ALUMINUM

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	1220	°F
COMBUSTION TEMPERATURE	-	°F
HEAT OF COMBUSTION	-	BTU/LB
MATERIAL DENSITY	169	LB/CU.FT.
BULK DENSITY	10	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	POOR
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	UNSATISFACTORY
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	UNSATISFACTORY
CHEMICAL DEGRADABILITY	UNSATISFACTORY
REUSABILITY	POOR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	4.0	10.0	7.0	4	
RECYCLE	A B	7.0	9.0	8.0	2	
PYROLYSIS	A C	3.2	7.4	5.3	5	
COMPOSTING	A C	2.8	7.4	5.1	8	
BALING	B	9.4	7.4	8.4	1	
INCINERATION	A C	3.6	6.0	4.8	7	
SANITARY LANDFILL	B	7.4	6.8	7.1	3	
SEA DISPOSAL	B	5.6	3.8	4.7	8	

PRE-PROCESSES: A - SEPARATION, B - COMPACTION, C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	24	C-24	

1 MATERIAL DESCRIPTION

CATEGORY	METAL
NAME	LEAD
COMMON NAME (FORM)	LEAD (SHEET)
USES	TUBES
FEDERAL/ MILITARY SPECIFICATION NUMBER	QQ-L-201
COMPOSITION	VIRGIN AND/OR RECLAIMED LEAD

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	621	^oF
COMBUSTION TEMPERATURE	-	^oF
HEAT OF COMBUSTION	-	BTU/LB
MATERIAL DENSITY	710	LB/CU.FT.
BULK DENSITY	100	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	POOR
SEPARABILITY	FAIR
COMPACTIBILITY	UNSATISFACTORY
COMBUSTIBILITY	UNSATISFACTORY
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	UNSATISFACTORY
CHEMICAL DEGRADABILITY	UNSATISFACTORY
REUSABILITY	GOOD

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	6.0	10.0	8.0	2	
RECYCLE	A B	7.4	9.0	8.2	1	
PYROLYSIS	A	2.0	7.4	4.7	5	
COMPOSTING	A	2.0	7.4	4.7	5	
BALING	B	3.2	7.4	5.3	3	
INCINERATION	A	2.5	6.0	4.3	6	
SANITARY LANDFILL	B	3.4	6.8	5.1	4	
SEA DISPOSAL	B	2.9	3.8	3.4	7	

PRE-PROCESSES: A - SEPARATION, B - COMPACTION, C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	25	C-25	

1	MATERIAL DESCRIPTION
CATEGORY	METAL
NAME	STEEL, IRON
COMMON NAME (FORM)	METAL CYLINDERS (SOLID STOCK)
USES	CYLINDERS, CAPS
FEDERAL/ MILITARY SPECIFICATION NUMBER	-
COMPOSITION	IRON, CARBON, MANGANESE, PHOSPHORUS, SULPHUR, SILICON

2	CHEMICAL PROPERTIES	
MELTING TEMPERATURE	2800	°F
COMBUSTION TEMPERATURE	-	°F
HEAT OF COMBUSTION	-	BTU/LB
MATERIAL DENSITY	489	LB/CU.FT.
BULK DENSITY	15	LB/CU.FT.

3	CHARACTERISTICS
FRAGMENTABILITY	UNSATISFACTORY
SEPARABILITY	EXCELLENT
COMPACTIBILITY	POOR
COMBUSTIBILITY	UNSATISFACTORY
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	GOOD

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	8.0	10.0	9.0	1	
RECYCLE	A B	4.8	9.0	6.9	2	
PYROLYSIS	A	2.8	7.4	5.1	5	
COMPOSTING	A	2.4	7.4	4.9	8	
BALING	B	5.8	7.4	8.6	3	
INCINERATION	A	1.5	6.0	3.8	7	
SANITARY LANDFILL		3.6	8.8	5.2	4	
SEA DISPOSAL		3.7	3.8	3.8	7	

PRE-PROCESSES: A = SEPARATION, B = COMPACTION, C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE NO.	OTHER
26	C-26	

1 MATERIAL DESCRIPTION

CATEGORY	METAL
NAME	STEEL, IRON
COMMON NAME (FORM)	METAL DRUMS (SHEET)
USES	DRUMS
FEDERAL/ MILITARY SPECIFICATION NUMBER	PPP-D-705 PPP-D-711
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	2800	^oF
COMBUSTION TEMPERATURE	-	^oF
HEAT OF COMBUSTION	-	BTU/LB
MATERIAL DENSITY	489	LB/CU.FT.
BULK DENSITY	6	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	POOR
SEPARABILITY	EXCELLENT
COMPACTIBILITY	FAIR
COMBUSTIBILITY	UNSATISFACTORY
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	UNSATISFACTORY
CHEMICAL DEGRADABILITY	UNSATISFACTORY
REUSABILITY	EXCELLENT

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	10.0	10.0	10.0	1	
RECYCLE	A B	7.6	9.0	8.3	2	
PYROLYSIS	A C	3.6	7.4	5.5	5	
COMPOSTING	A C	3.2	7.4	5.3	6	
BALING	B	7.6	7.4	7.5	3	
INCINERATION	A	3.2	6.0	4.6	7	
SANITARY LANDFILL	B	5.3	6.8	6.1	4	
SEA DISPOSAL	B	4.4	3.8	4.1	6	

PRE-PROCESSES A - SEPARATION
B - COMPACTION
C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
27	C-27	

1 MATERIAL DESCRIPTION

CATEGORY	METAL
NAME	STEEL, IRON
COMMON NAME (FORM)	METAL STRAPPING (STRAPS)
USES	STRAPPING
FEDERAL/ MILITARY SPECIFICATION NUMBER	QQ-S-781
COMPOSITION	IRON, CARBON, MANGANESE, PHOSPHORUS, SULPHUR, SILICON

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	2800	°F
COMBUSTION TEMPERATURE	-	°F
HEAT OF COMBUSTION	-	BTU/LB
MATERIAL DENSITY	489	LB/CU.FT.
BULK DENSITY	489	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	UNSATISFACTORY
SEPARABILITY	EXCELLENT
COMPACTIBILITY	POOR
COMBUSTIBILITY	UNSATISFACTORY
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	UNSATISFACTORY
CHEMICAL DEGRADABILITY	UNSATISFACTORY
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	1.0	10.0	5.5	3	
RECYCLE	A B	9.0	9.0	9.0	1	
PYROLYSIS	A	2.8	7.4	5.1	4	
COMPOSTING		2.4	7.4	4.9	5	
BALING	B	2.2	7.4	4.8	6	
INCINERATION	A	2.5	6.0	4.3	7	
SANITARY LANDFILL		4.6	6.8	5.7	2	
SEA DISPOSAL		4.1	3.8	4.0	8	

PRE-PROCESSES: A = SEPARATION; B = COMPACTION; C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
28	C-28	

1 MATERIAL DESCRIPTION

CATEGORY	METAL
NAME	TIN-PLATED STEEL
COMMON NAME (FORM)	TIN CANS (SHEET)
USES	CANS
FEDERAL/ MILITARY SPECIFICATION NUMBER	PPP-C-96 PPP-C-29
COMPOSITION	STEEL WITH AN EXTREMELY THIN TIN COATING

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	449 (TIN) °F 2800 (STEEL)
COMBUSTION TEMPERATURE	- °F
HEAT OF COMBUSTION	- BTU/LB
MATERIAL DENSITY	488 LB/CU.FT.
BULK DENSITY	25 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	FAIR
SEPARABILITY	EXCELLENT
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	UNSATISFACTORY
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	UNSATISFACTORY
CHEMICAL DEGRADABILITY	UNSATISFACTORY
REUSABILITY	GOOD

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	6.5	10.0	9.3	1	
RECYCLE	A B	8.8	9.0	6.9	2	
PYROLYSIS	A C	4.0	7.4	5.7	5	
COMPOSTING	A C	3.6	7.4	5.6	6	
BALING	B	9.4	7.4	6.4	3	
INCINERATION	A	3.8	8.0	4.9	7	
SANITARY LANDFILL	B	7.2	6.6	7.0	4	
SEA DISPOSAL	B	5.6	3.6	4.7	8	

PRE-PROCESSES
A - SEPARATION
B - COMPACTION
C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
29	C-29	

1 MATERIAL DESCRIPTION

CATEGORY	METAL
NAME	TIN PLATED STEEL/ ALUMINUM
COMMON NAME (FORM)	BIMETALLICS (SHEET)
USES	CANS
FEDERAL/ MILITARY SPECIFICATION NUMBER	-
COMPOSITION	STEEL/ALUMINUM WITH EXTREMELY THIN TIN COATING

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	449(TIN) 2800(STEEL) 1200(AL) °F
COMBUSTION TEMPERATURE	- °F
HEAT OF COMBUSTION	- BTU/LB
MATERIAL DENSITY	488 LB/CU.FT.
BULK DENSITY	25 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	FAIR
SEPARABILITY	EXCELLENT
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	UNSATISFACTORY
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	UNSATISFACTORY
CHEMICAL DEGRADABILITY	UNSATISFACTORY
REUSABILITY	GOOD

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	6.5	10.0	9.3	1	
RECYCLE	A B	6.6	9.0	8.9	2	
PYROLYSIS	A C	4.0	7.4	5.7	5	
COMPOSTING	A C	3.6	7.4	5.5	6	
BALING	B	9.4	7.4	8.4	3	
INCINERATION	A	3.8	6.0	4.9	7	
SANITARY LANDFILL	B	7.2	6.6	7.0	4	
SEA DISPOSAL	P	5.6	3.6	4.7	6	

PRE-PROCESSES: A = SEPARATION, B = COMPACTION, C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	30	C-30	

1	MATERIAL DESCRIPTION
CATEGORY	METAL
NAME	VARIOUS METALS
COMMON NAME (FORM)	AEROSOLS (SHEET)
USES	PRESSURIZED CANS
FEDERAL/ MILITARY SPECIFICATION NUMBER	PPP-C-96
COMPOSITION	ELECTROTIN PLATED STEEL

2	CHEMICAL PROPERTIES
MELTING TEMPERATURE	449(TIN) °F 2800(STEEL)
COMBUSTION TEMPERATURE	- °F
HEAT OF COMBUSTION	- BTU/LB
MATERIAL DENSITY	488 LB/CU.FT.
BULK DENSITY	3 LB/CU.FT.

3	CHARACTERISTICS
FRAGMENTABILITY	UNSATISFACTORY
SEPARABILITY	EXCELLENT
COMPACTIBILITY	POOR
COMBUSTIBILITY	UNSATISFACTORY
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	UNSATISFACTORY
CHEMICAL DEGRADABILITY	UNSATISFACTORY
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PRO-CESS	OPERA-TIONAL RATING	ENVIRON-MENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECO-NOMIC RANKING *
REUSE	A	5.0	10.0	7.5	1	
RECYCLE	A B	4.8	9.0	8.9	2	
PYROLYSIS	A	2.8	7.4	5.1	5	
COMPOSTING	A	2.4	7.4	4.9	8	
BALING	B	5.8	7.4	8.8	3	
INCINERATION	A	1.5	8.0	3.8	7	
SANITARY LANDFILL	B	3.8	8.8	5.2	4	
SEA DISPOSAL	B	3.2	3.8	3.5	8	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
31	C-31	

1 MATERIAL DESCRIPTION

CATEGORY	PAPER
NAME	FIBERBOARD
COMMON NAME (FORM)	COATED CORRUGATED CONTAINERBOARD (SHEET)
USES	CONTAINERS
FEDERAL/MILITARY SPECIFICATION NUMBER	PPP-B-1608
COMPOSITION	KRAFT PAPER COATED AND/OR RESIN

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	-	°F
COMBUSTION TEMPERATURE	600	°F
HEAT OF COMBUSTION	7420	BTU/LB
MATERIAL DENSITY	47	LB/CU.FT.
BULK DENSITY	2	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	GOOD
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	EXCELLENT

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	8.5	10.0	9.3	1	
RECYCLE	A B	5.2	9.0	7.1	4	
PYROLYSIS	A C	7.8	7.8	7.6	3	
COMPOSTING	A C	6.2	7.8	7.0	5	
BALING	B	9.4	7.8	8.6	2	
INCINERATION	A C	9.1	6.4	7.8	3	
SANITARY LANDFILL	B	7.2	7.0	7.1	4	
SEA DISPOSAL	B	5.6	4.2	4.9	6	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	32	C-31	

1 MATERIAL DESCRIPTION

CATEGORY	PAPER
NAME	FIBERBOARD
COMMON NAME (FORM)	CORRUGATED AND SOLID BOARD OR CONTAINERBOARD (SHEET)
USES	CONTAINERS
FEDERAL/MILITARY SPECIFICATION NUMBER	PPP-B-640 PPP-B-636 PPP-B-676 PPP-F-320 PPP-B-1364
COMPOSITION	ANY ORGANIC FIBER, WOOD PULP, WOOD CHIP, OR BAGASSE

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	- °F
COMBUSTION TEMPERATURE	440 °F
HEAT OF COMBUSTION	7043 BTU/LB
MATERIAL DENSITY	13 LB/CU.FT.
BULK DENSITY	1 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	GOOD
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	EXCELLENT

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	8.5	10.0	9.3	1	
RECYCLE	A B	7.0	9.0	8.0	3	
PYROLYSIS	C	7.8	7.8	7.8	4	
COMPOSTING	A C	6.6	7.8	7.2	5	
BALING	B	9.4	7.8	8.8	2	
INCINERATION	A C	9.1	6.4	7.8	4	
SANITARY LANDFILL	B	6.9	7.0	7.0	6	
SEA DISPOSAL	B	5.0	4.2	4.6	7	

PRE-PROCESSES A - SEPARATION
B - COMPACTION
C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

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9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
33	C-33	

1 MATERIAL DESCRIPTION

CATEGORY	PAPER
NAME	FIBERBOARD
COMMON NAME (FORM)	WAX-IMPREGNATED CORRUGATED BOARD (SHEET)
USES	CONTAINERS
FEDERAL/ MILITARY SPECIFICATION NUMBER	PPP-B-1163 MIL-C-3955
COMPOSITION	KRAFT PAPER IMPREGNATED WITH WATER AND GREASE RESISTANT COATINGS (VARIETY 4)

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	-	°F
COMBUSTION TEMPERATURE	500	°F
HEAT OF COMBUSTION	7703	BTU/LB
MATERIAL DENSITY	47	LB/CU.FT.
BULK DENSITY	2	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	GOOD
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	EXCELLENT

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	8.5	10.0	9.3	1	
RECYCLE	A B	5.2	9.0	7.1	4	
PYROLYSIS	A C	7.8	7.8	7.8	3	
COMPOSTING	A C	6.2	7.8	7.0	5	
BALING	B	9.[illegible]	7.8	8.8	2	
INCINERATION	A C	9.1	8.4	7.8	3	
SANITARY LANDFILL	B	7.2	7.0	7.1	4	
SEA DISPOSAL	B	5.8	4.2	4.9	6	

PRE-PROCESSES: A - SEPARATION, B - COMPACTION, C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	34	C-34	

1 MATERIAL DESCRIPTION

CATEGORY	PAPER
NAME	PAPER
COMMON NAME (FORM)	BAG, SACK (SHEET)
USES	BAGS, SACKS
FEDERAL/MILITARY SPECIFICATION NUMBER	PPP-S-30 UU-B-36 UU-S-48
COMPOSITION	SULPHATE PULP (UNBLEACHED SULPHATE OR KRAFT PAPER)

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	-	^{o}F
COMBUSTION TEMPERATURE	300	^{o}F
HEAT OF COMBUSTION	7706	BTU/LB
MATERIAL DENSITY	40	LB/CU.FT.
BULK DENSITY	8	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	POOR
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	GOOD

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	5.5	10.0	7.8	1	
RECYCLE	A B	5.2	9.0	7.1	5	
PYROLYSIS	A C	7.4	7.6	7.6	3	
COMPOSTING	A C	6.2	7.8	7.0	6	
BALING	B	7.4	7.8	7.6	3	
INCINERATION	A C	9.0	6.4	7.7	2	
SANITARY LANDFILL	B	7.6	7.0	7.3	4	
SEA DISPOSAL	B	5.9	4.2	5.1	7	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

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DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
35	C-35	

1 MATERIAL DESCRIPTION

CATEGORY	PAPER
NAME	PAPER
COMMON NAME (FORM)	COATED, IMPREGNATED (SHEET)
USES	WRAPPING, BAGS
FEDERAL/ MILITARY SPECIFICATION NUMBER	MIL-P-20293 UU-P-134
COMPOSITION	ASPHALT-IMPREGNATED KRAFT PAPER

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	-	°F
COMBUSTION TEMPERATURE	225	°F
HEAT OF COMBUSTION	7706	BTU/LB
MATERIAL DENSITY	47	LB/CU.FT.
BULK DENSITY	12	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	GOOD
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	EXCELLENT

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	8.5	10.0	9.3	1	
RECYCLE	A B	5.2	9.0	7.1	4	
PYROLYSIS	A C	7.8	7.8	7.8	2	
COMPOSTING	A C	6.2	7.8	7.0	5	
BALING	B	7.0	7.8	7.4	3	
INCINERATION	A C	9.1	6.4	7.8	2	
SANITARY LANDFILL	B	7.2	7.0	7.1	4	
SEA DISPOSAL	B	5.6	4.2	4.9	6	

PRE-PROCESSES: A = SEPARATION
B = COMPACTION
C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

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9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
36	C-36	

1 MATERIAL DESCRIPTION

CATEGORY	PAPER
NAME	PAPER
COMMON NAME (FORM)	CONVERTING, ENVELOPE (SHEET)
USES	ENVELOPES, TAPES
FEDERAL/MILITARY SPECIFICATION NUMBER	PPP-T-45
COMPOSITION	KRAFT PAPER WITH ASPHALT LAMINATION

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	- °F
COMBUSTION TEMPERATURE	150 °F
HEAT OF COMBUSTION	8088 BTU/LB
MATERIAL DENSITY	51 LB/CU.FT.
BULK DENSITY	51 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	GOOD
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	1.5	10.0	5.8	7	
RECYCLE	A B	3.6	9.0	6.3	6	
PYROLYSIS	A	6.6	7.8	7.2	3	
COMPOSTING	A	5.2	7.6	6.5	5	
BALING	B	6.4	7.6	7.1	4	
INCINERATION	A	9.1	6.4	7.8	1	
SANITARY LANDFILL	B	7.7	7.0	7.4	2	
SEA DISPOSAL	B	5.6	4.2	5.0	8	

PRE-PROCESSES: A = SEPARATION
B = COMPACTION
C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

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SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	37	C-37	

1 MATERIAL DESCRIPTION

CATEGORY	PAPER
NAME	PAPER
COMMON NAME (FORM)	NEWSPRINT (SHEET, SHREDS)
USES	WRAPPING, DUNNAGE
FEDERAL/MILITARY SPECIFICATION NUMBER	-
COMPOSITION	GROUND WOOD PULP (75%) CHEMICAL PULP (25%)

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	- °F
COMBUSTION TEMPERATURE	150 °F
HEAT OF COMBUSTION	7974 BTU/LB
MATERIAL DENSITY	42 LB/CU.FT.
BULK DENSITY	21 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	UNSATISFACTORY
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	FAIR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	3.5	10.0	6.8	5	
RECYCLE	A B	3.8	9.0	8.4	6	
PYROLYSIS	A	7.4	7.8	7.6	2	
COMPOSTING	A	6.2	7.8	7.0	4	
BALING	B	6.8	7.8	7.3	3	
INCINERATION	A	9.2	6.4	7.8	1	
SANITARY LANDFILL	B	8.2	7.0	7.6	2	
SEA DISPOSAL	B	6.2	4.2	5.2	7	

PRE-PROCESSES: A = SEPARATION, B = COMPACTION, C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
38	C-38	

1 MATERIAL DESCRIPTION

CATEGORY	PAPER
NAME	PAPER
COMMON NAME (FORM)	PULP (MOLDED)
USES	TRAYS
FEDERAL/ MILITARY SPECIFICATION NUMBER	-
COMPOSITION	MECHANICAL WOOD PULP OR GROUNDWOOD

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	-	°F
COMBUSTION TEMPERATURE	350	°F
HEAT OF COMBUSTION	7341	BTU/LB
MATERIAL DENSITY	38	LB/CU.FT.
BULK DENSITY	38	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	UNSATISFACTORY
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	GOOD
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	GOOD

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	4.5	10.0	7.3	3	
RECYCLE	A B	5.0	9.0	7.0	5	
PYROLYSIS	A C	7.0	7.8	7.4	2	
COMPOSTING	A C	5.8	7.5	6.8	8	
BALING	B	5.8	7.8	6.8	6	
INCINERATION	A	7.8	6.4	7.1	4	
SANITARY LANDFILL	B	8.0	7.0	7.5	1	
SEA DISPOSAL	B	6.2	4.2	5.2	7	

PRE-PROCESSES: A = SEPARATION
B = COMPACTION
C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

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8* OFF-BASE DISPOSAL/ PROCESSING DATA

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SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
39	C-39	

1 MATERIAL DESCRIPTION

CATEGORY	PAPER
NAME	PAPER
COMMON NAME (FORM)	TISSUE (SHEET)
USES	WRAPPING
FEDERAL/MILITARY SPECIFICATION NUMBER	UU-P-553
COMPOSITION	SULPHATE PULP, BLEACHED KRAFT PAPER

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	- °F
COMBUSTION TEMPERATURE	150 °F
HEAT OF COMBUSTION	6999 BTU/LB
MATERIAL DENSITY	21 LB/CU.FT.
BULK DENSITY	10 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	POOR
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	FAIR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	4.5	10.0	7.3	4	
RECYCLE	A B	5.8	9.0	7.4	3	
PYROLYSIS	A C	7.4	7.8	7.6	2	
COMPOSTING	A C	5.8	7.8	6.8	6	
BALING	B	6.8	7.8	7.3	4	
INCINERATION	A C	9.0	6.4	7.7	1	
SANITARY LANDFILL	B	7.3	7.0	7.2	5	
ESA DISPOSAL	B	5.5	4.2	4.9	7	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
40	C-40	

1 MATERIAL DESCRIPTION

CATEGORY	PAPER
NAME	PAPER
COMMON NAME (FORM)	VCI TREATED PACKAGING MATERIALS (SHEET)
USES	CONTAINERS
FEDERAL/MILITARY SPECIFICATION NUMBER	MIL-P-3420
COMPOSITION	FLAT KRAFT PAPER COATED OR IMPREGNATED WITH CORROSION INHIBITORS

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	-	°F
COMBUSTION TEMPERATURE	440	°F
HEAT OF COMBUSTION	7706	BTU/LB
MATERIAL DENSITY	40	LB/CU.FT.
BULK DENSITY	2	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	GOOD
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	EXCELLENT

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	6.0	10.0	9.0	1	
RECYCLE	A B	5.2	9.0	7.1	4	
PYROLYSIS	C	7.6	7.8	7.6	3	
COMPOSTING	A C	6.2	7.8	7.0	5	
BALING	B	9.4	7.6	8.6	2	
INCINERATION	A C	9.1	6.4	7.6	3	
SANITARY LANDFILL	B	7.2	7.0	7.1	4	
SEA DISPOSAL	B	5.6	4.2	4.9	6	

PRE-PROCESSES: A - SEPARATION
B - COMPACTION
C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	41	C-41	

1 MATERIAL DESCRIPTION

CATEGORY	PAPER
NAME	PAPER
COMMON NAME (FORM)	WAX PAPER (SHREDS)
USES	WRAPPING, DUNNAGE
FEDERAL/ MILITARY SPECIFICATION NUMBER	-
COMPOSITION	KRAFT PAPER IMPREGNATED WITH WAX COATING

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	- °F
COMBUSTION TEMPERATURE	500 °F
HEAT OF COMBUSTION	11,327 BTU/LB
MATERIAL DENSITY	47 LB/CU.FT.
BULK DENSITY	47 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	FAIR
CHEMICAL DEGRADABILITY	GOOD
REUSABILITY	FAIR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	4.0	10.0	7.0	4	
RECYCLE	A B	3.0	9.0	6.0	6	
PYROLYSIS	A	6.4	7.8	7.1	3	
COMPOSTING	A	5.2	7.8	6.5	5	
BALING	B	6.4	7.8	7.1	3	
INCINERATION	A	8.8	6.4	7.6	1	
SANITARY LANDFILL	B	7.3	7.0	7.2	2	
SEA DISPOSAL	B	5.3	4.2	4.8	7	

PRE-PROCESSES: A = SEPARATION
B = COMPACTION
C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
42	C-42	

1 MATERIAL DESCRIPTION

CATEGORY	PAPER
NAME	PAPER
COMMON NAME (FORM)	WRAPPING (SHEET)
USES	WRAPPING, BAGS
FEDERAL/ MILITARY SPECIFICATION NUMBER	UU-P-268
COMPOSITION	UNTREATED KRAFT PAPER

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	- °F
COMBUSTION TEMPERATURE	300 °F
HEAT OF COMBUSTION	7706 BTU/LB
MATERIAL DENSITY	40 LB/CU.FT.
BULK DENSITY	10 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	POOR
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	FAIR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	4.5	10.0	7.3	5	
RECYCLE	A B	5.8	9.0	7.4	4	
PYROLYSIS	A C	7.4	7.8	7.6	2	
COMPOSTING	A C	6.2	7.8	7.0	6	
BALING	B	7.0	7.6	7.4	4	
INCINERATION	A C	9.0	6.4	7.7	1	
SANITARY LANDFILL	B	8.0	7.0	7.5	3	
SEA DISPOSAL	B	6.2	4.2	5.2	7	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	43	C-43	

1	MATERIAL DESCRIPTION
CATEGORY	PAPER
NAME	PAPERBOARD
COMMON NAME (FORM)	CHIPBOARD, BOXBOARD (SHEET)
USES	BOXES
FEDERAL/ MILITARY SPECIFICATION NUMBER	UU-C-282 PPP-B-566
COMPOSITION	100% RECLAIMED PLAIN FIBER NEWS, MIXED, CORRUGATED

2	CHEMICAL PROPERTIES	
MELTING TEMPERATURE	-	°F
COMBUSTION TEMPERATURE	440	°F
HEAT OF COMBUSTION	7572	BTU/LB
MATERIAL DENSITY	41	LB/CU.FT.
BULK DENSITY	2	LB/CU.FT.

3	CHARACTERISTICS
FRAGMENTABILITY	GOOD
SEPARABILITY	POOR
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	EXCELLENT

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	6.5	10.0	6.3	2	
RECYCLE	A B	7.0	9.0	8.0	3	
PYROLYSIS	A C	7.4	7.8	7.6	5	
COMPOSTING	A C	6.2	7.6	7.0	7	
BALING	B	9.4	7.6	8.6	1	
INCINERATION	A C	9.0	6.4	7.7	4	
SANITARY LANDFILL	B	8.0	7.0	7.5	8	
SEA DISPOSAL	B	6.2	4.2	5.2	8	

PRE-PROCESSES: A = SEPARATION, B = COMPACTION, C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

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10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE NO.	OTHER
44	C-44	

1 MATERIAL DESCRIPTION

CATEGORY	PAPER
NAME	PAPERBOARD
COMMON NAME (FORM)	SPIRALLY WOUND FIBER CAN (TUBE)
USES	CAN
FEDERAL/MILITARY SPECIFICATION NUMBER	MIL-C-2439
COMPOSITION	(TYPE I, GR B, STYLE A, CAN) ADHESIVES, BARRIER MATERIAL AMMUNITION CONTAINERBOARD AL FOIL, DUPLEX AND ASPHALT IMPREGNATED KRAFT

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	- °F
COMBUSTION TEMPERATURE	700 °F
HEAT OF COMBUSTION	8800 BTU/LB
MATERIAL DENSITY	52 LB/CU.FT.
BULK DENSITY	2 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	FAIR
SEPARABILITY	GOOD
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	GOOD
REUSABILITY	EXCELLENT

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	8.5	10.0	9.3	1	
RECYCLE	A B	3.4	9.0	6.2	7	
PYROLYSIS	A C	8.4	7.8	7.1	4	
COMPOSTING	A C	4.8	7.8	8.3	8	
BALING	B	8.8	7.8	8.3	2	
INCINERATION	A C	8.4	6.4	7.4	3	
SANITARY LANDFILL	B	6.8	8.8	8.8	5	
SEA DISPOSAL	B	5.2	4.2	4.7	8	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

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SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE NO.	OTHER
45	[illegible]-45	

1 MATERIAL DESCRIPTION

CATEGORY	PAPER 3
NAME	PAPER/FOIL LAMINATION
COMMON NAME (FORM)	POLYOLEFIN/FOIL/PAPER (SHEET)
USES	WRAPPING, BARRIER MATERIAL
FEDERAL/MILITARY SPECIFICATION NUMBER	MIL-B-131
COMPOSITION	PROPYLENE PLASTIC PRODUCED WITH BUTYLENE OR STYRENE

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	300 °F
COMBUSTION TEMPERATURE	700 °F
HEAT OF COMBUSTION	18,000 BTU/LB
MATERIAL DENSITY	60-80 LB/CU.FT.
BULK DENSITY	40-70 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	2.0	10.0	6.0	4	
RECYCLE	A B	1.8	8.0	5.4	7	
PYROLYSIS	A C	4.6	7.8	6.2	3	
COMPOSTING	A C	4.0	7.8	5.8	5	
BALING	B	5.2	7.8	6.5	2	
INCINERATION	A C	5.2	6.2	5.7	8	
SANITARY LANDFILL	B	5.8	7.4	6.7	1	
SEA DISPOSAL	B	4.4	4.2	4.3	8	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/APPLICABLE REGULATIONS

PRODUCES OFFENSIVE ODOR WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
46	C-46	

1 MATERIAL DESCRIPTION

CATEGORY	PAPER
NAME	PAPERBOARD/METAL
COMMON NAME (FORM)	METAL-EDGED PAPERBOARD (SHEET)
USED	BOXES
FEDERAL/ MILITARY SPECIFICATION NUMBER	PPP-B-665
COMPOSITION	(STYLES A-E) AT LEAST 75% RECLAIMED FIBER CONTENT. REMAINDER KRAFT PAPER. STEEL METAL STAYS.

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	-	^{o}F
COMBUSTION TEMPERATURE	440	^{o}F
HEAT OF COMBUSTION	7043	BTU/LB
MATERIAL DENSITY	48	LB/CU.FT.
BULK DENSITY	1	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	GOOD
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	FAIR
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	EXCELLENT

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROC.	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	8.5	10.0	9.3	1	
RECYCLE	A B	5.8	9.0	7.4	5	
PYROLYSIS	A C	7.4	7.8	7.6	3	
COMPOSTING	A C	4.2	7.8	6.0	7	
BALING	B	8.8	7.8	8.3	2	
INCINERATION	A C	8.6	6.4	7.5	4	
SANITARY LANDFILL	B	6.6	7.0	6.8	6	
SEA DISPOSAL	B	5.0	4.2	4.6	8	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
47	C-47	

1 MATERIAL DESCRIPTION

CATEGORY	PAPER
NAME	PAPERBOARD/METAL
COMMON NAME (FORM)	METAL EDGED PAPERBOARD (SHEET)
USES	DRUMS, TUBES
FEDERAL/ MILITARY SPECIFICATION NUMBER	PPP-D-723
COMPOSITION	AT LEAST 40% RECLAIMED FIBERS, REMAINDER-VIRGI·, KRAFT PAPER, LOW CARBON STEEL, AL BARRIER BOARD

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	-	°F
COMBUSTION TEMPERATURE	440	°F
HEAT OF COMBUSTION	7043	BTU/LB
MATERIAL DENSITY	46	LB/CU.FT.
BULK DENSITY	3	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	GOOD
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	FAIR
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	EXCELLENT

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	6.5	10.0	9.3	1	
RECYCLE	A B	5.8	9.0	7.4	5	
PYROLYSIS	A C	7.4	7.6	7.6	3	
COMPOSTING	A C	4.2	7.8	6.0	7	
BALING	B	8.8	7.6	8.3	2	
INCINERATION	A C	8.6	6.4	7.5	4	
SANITARY LANDFILL	B	6.6	7.0	8.8	6	
SEA DISPOSAL	B	5.0	4.2	4.6	6	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
48	C-48	

1 MATERIAL DESCRIPTION

CATEGORY	PAPER
NAME	FIBERBOARD/WOOD
COMMON NAME (FORM)	WOOD-CLEATED FIBERBOARD (SHEET)
USES	BOXES
FEDERAL/ MILITARY SPECIFICATION NUMBER	PPP-B-591
COMPOSITION	VIRGIN OR RECLAIMED FIBERS, DOUGLAS FIR CLEATS, STEEL NAILS OR STAPLES

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	-	°F
COMBUSTION TEMPERATURE	523	°F
HEAT OF COMBUSTION	7841	BTU/LB
MATERIAL DENSITY	29	LB/CU.FT.
BULK DENSITY	2	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	FAIR
SEPARABILITY	GOOD
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	GOOD
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	EXCELLENT

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	8.5	10.0	9.3	1	
RECYCLE	A B	4.0	9.0	6.5	6	
PYROLYSIS	A C	7.8	7.8	7.7	3	
COMPOSTING	A C	6.2	7.8	7.0	5	
BALING	B	8.8	7.8	8.3	2	
INCINERATION	A C	7.9	6.4	7.2	4	
SANITARY LANDFILL	B	6.7	7.2	7.0	5	
SEA DISPOSAL	B	5.2	4.2	4.7	7	

PRE-PROCESSES: A = SEPARATION, B = COMPACTION, C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
49	C-49	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	ACRYLONITRILE, BUTADIENE, STYRENE
COMMON NAME (FORM)	ABS (SOLID STOCK, SHEET)
USES	TRAYS, CONTAINERS
FEDERAL/ MILITARY SPECIFICATION NUMBER	L-P-1183
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	300-500 °F
COMBUSTION TEMPERATURE	700-800 °F
HEAT OF COMBUSTION	8830 BTU/LB
MATERIAL DENSITY	63.65-67.39 LB/CU.FT.
BULK DENSITY	5-7 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	FAIR
COMPACTIBILITY	GOOD
COMBUSTIBILITY	FAIR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	POOR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	4.5	10.0	7.3	1	
RECYCLE	A B	4.4	9.0	8.7	3	
PYROLYSIS	A C	4.8	7.8	6.3	5	
COMPOSTING	A C	4.2	7.8	6.0	6	
BALING	B	6.6	7.8	7.2	2	
INCINERATION	A C	6.7	8.2	6.5	4	
SANITARY LANDFILL	B	6.0	7.4	6.7	3	
SEA DISPOSAL	B	4.5	4.2	4.4	7	

PRE-PROCESSES: A - SEPARATION
B - COMPACTION
C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
50	C-50	

1* MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	CELLULOSICS
COMMON NAME (FORM)	CELLOPHANE (FILM)
USES	WRAPPING, BAGS
FEDERAL/MILITARY SPECIFICATION NUMBER	L-C-110 PPP-B-15
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	300-350 °F
COMBUSTION TEMPERATURE	600 °F
HEAT OF COMBUSTION	1600 BTU/LB
MATERIAL DENSITY	74.88-96.72 LB/CU.FT.
BULK DENSITY	70 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	GOOD
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	2.0	10.0	6.0	6	
RECYCLE	A B	3.6	9.0	6.3	4	
PYROLYSIS	A C	4.6	7.6	6.2	5	
COMPOSTING	A C	4.0	7.8	5.9	7	
BALING	B	5.6	7.6	6.7	3	
INCINERATION	A C	7.7	6.2	7.0	1	
SANITARY LANDFILL	B	6.1	7.4	6.6	2	
SEA DISPOSAL	B	4.6	4.2	4.4	8	

PRE-PROCESSES: A = SEPARATION
B = COMPACTION
C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
51	C-51	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	CELLULOSICS
COMMON NAME (FORM)	CELLULOSE ACETATE (FOAM)
USES	CUSHIONING
FEDERAL/MILITARY SPECIFICATION NUMBER	PPP-C-843
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	340-500 °F
COMBUSTION TEMPERATURE	840 °F
HEAT OF COMBUSTION	15770 BTU/LB
MATERIAL DENSITY	6-6 LB/CU.FT.
BULK DENSITY	2-8 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	FAIR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	2.5	10.0	6.3	3	
RECYCLE	A B	4.0	9.0	6.5	2	
PYROLYSIS	A C	4.8	7.8	6.3	3	
COMPOSTING	A C	4.2	7.8	6.0	5	
BALING	B	5.6	7.8	6.7	1	
INCINERATION	A C	6.8	6.2	6.5	2	
SANITARY LANDFILL	B	4.9	7.4	6.2	4	
SEA DISPOSAL	B	3.4	4.2	3.8	6	

PRE-PROCESSES: A = SEPARATION, B = COMPACTION, C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
52	C-52	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	CELLULOSICS
COMMON NAME (FORM)	CELLULOSE ACETATE (SHEET, FILM)
USES	WRAPPING
FEDERAL/MILITARY SPECIFICATION NUMBER	L-P-504
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	340-500 °F
COMBUSTION TEMPERATURE	840 °F
HEAT OF COMBUSTION	15770 BTU/LB
MATERIAL DENSITY	71.76-82.37 LB/CU.FT.
BULK DENSITY	50-70 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	2.0	10.0	6.0	5	
RECYCLE	A B	3.6	9.0	6.3	3	
PYROLYSIS	A C	4.6	7.6	6.2	4	
COMPOSTING	A C	4.0	7.6	5.9	6	
BALING	B	5.6	7.8	6.7	1	
INCINERATION	A C	5.7	6.2	6.0	5	
SANITARY LANDFILL	B	5.7	7.4	6.6	2	
SEA DISPOSAL	B	4.2	4.2	4.2	7	

PRE-PROCESSES: A - SEPARATION, B - COMPACTION, C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
53	C-53	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	CELLULOSICS
COMMON NAME (FORM)	CELLULOSE ACETATE BUTYRATE (SOLID STOCK)
USES	CONTAINERS
FEDERAL/MILITARY SPECIFICATION NUMBER	L-P-397 L-P-349
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	340-500 °F
COMBUSTION TEMPERATURE	640 °F
HEAT OF COMBUSTION	15,770 BTU/LB
MATERIAL DENSITY	71.76-62.37 LB/CU.FT.
BULK DENSITY	5-7 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	FAIR
COMPACTIBILITY	GOOD
COMBUSTIBILITY	FAIR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	POOR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	4.5	10.0	7.3	2	
RECYCLE	A B	4.4	9.0	6.7	4	
PYROLYSIS	A C	4.6	7.8	6.3	6	
COMPOSTING	A C	4.2	7.8	6.0	7	
BALING	B	7.0	7.6	7.4	1	
INCINERATION	A C	8.7	6.2	6.5	5	
SANITARY LANDFILL	B	6.2	7.4	6.8	3	
SEA DISPOSAL	B	4.7	4.2	4.5	8	

PRE-PROCESSES: A = SEPARATION, B = COMPACTION, C = SHREDDING

5* SPECIAL PRECAUTIONS/APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES AND OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
54	C-54	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	CELLULOSICS
COMMON NAME (FORM)	STRIPPABLE PLASTIC COATING - COLD (FILM)
USES	COATING
FEDERAL/MILITARY SPECIFICATION NUMBER	MIL-P-45021
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	340-500 °F
COMBUSTION TEMPERATURE	800 °F
HEAT OF COMBUSTION	16,000 BTU/LB
MATERIAL DENSITY	72-82 LB/CU.FT.
BULK DENSITY	72-82 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	UNSATISFACTORY
COMPACTIBILITY	FAIR
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	1.0	10.0	5.5	5	
RECYCLE	A B	0.8	9.0	4.9	6	
PYROLYSIS	A	3.6	7.6	5.8	4	
COMPOSTING	A	3.8	7.8	5.8	4	
BALING	B	5.2	7.6	6.5	2	
INCINERATION	A	5.6	6.2	5.9	3	
SANITARY LANDFILL	B	5.7	7.4	6.6	1	
SEA DISPOSAL	B	4.2	4.2	4.2	7	

PRE-PROCESSES: A - SEPARATION, B - COMPACTION, C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES AND OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE NO.	OTHER
55	C-55	

1	MATERIAL DESCRIPTION
CATEGORY	PLASTIC
NAME	CELLULOSICS
COMMON NAME (FORM)	STRIPPABLE PLASTIC COATING - HOT (FILM)
USES	COATING
FEDERAL/ MILITARY SPECIFICATION NUMBER	MIL-P-149
COMPOSITION	-

2	CHEMICAL PROPERTIES
MELTING TEMPERATURE	340-500 °F
COMBUSTION TEMPERATURE	840 °F
HEAT OF COMBUSTION	15,770 BTU/LB
MATERIAL DENSITY	71.76-82.37 LB/CU.FT.
BULK DENSITY	70-80 LB/CU.FT.

3	CHARACTERISTICS
FRAGMENTABILITY	EXCELLENT
SEPARABILITY	UNSATISFACTORY
COMPACTIBILITY	FAIR
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	1.0	10.0	5.5	5	
RECYCLE	A B	0.8	9.0	4.9	6	
PYROLYSIS	A	3.8	7.8	5.8	4	
COMPOSTING	A	3.8	7.8	5.8	4	
BALING	B	5.2	7.8	6.5	2	
INCINERATION	A	5.6	6.2	5.9	3	
SANITARY LANDFILL	B	5.7	7.4	6.6	1	
SEA DISPOSAL	B	4.2	4.2	4.2	7	

PRE-PROCESSES
A - SEPARATION
B - COMPACTION
C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES AND OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
56	C-56	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	EPOXY
COMMON NAME (FORM)	EPOXY RESIN (FILM)
USES	COATING
FEDERAL/ MILITARY SPECIFICATION NUMBER	MIL-R-21931
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	250-500 °F
COMBUSTION TEMPERATURE	APPROX. 700 °F
HEAT OF COMBUSTION	APPROX. 1500 BTU/LB
MATERIAL DENSITY	72.38-75.50 LB/CU.FT.
BULK DENSITY	72.38-75.50 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	UNSATISFACTORY
COMPACTIBILITY	FAIR
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING
REUSE	A	1.0	10.0	5.5	6	
RECYCLE	A B	1.4	9.0	5.2	7	
PYROLYSIS	A C	4.4	7.8	6.1	3	
COMPOSTING	A C	3.8	7.8	5.8	5	
BALING	B	5.2	7.8	6.5	2	
INCINERATION	A C	5.6	6.2	5.9	4	
SANITARY LANDFILL	B	5.9	7.4	6.7	1	
SEA DISPOSAL	B	4.4	4.2	4.3	8	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
57	C-57	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	IONOMER
COMMON NAME (FORM)	SURLYN (FILM, SHEET)
USES	WRAPPING, MOLDED PARTS
FEDERAL/ MILITARY SPECIFICATION NUMBER	MIL-P-48124
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	280-350 °F
COMBUSTION TEMPERATURE	825 °F
HEAT OF COMBUSTION	16,000 BTU/LB
MATERIAL DENSITY	58.03-59.90 LB/CU.FT.
BULK DENSITY	50-60 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	FAIR
COMPACTIBILITY	GOOD
COMBUSTIBILITY	FAIR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	POOR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	4.5	10.0	7.3	1	
RECYCLE	A B	4.4	9.0	6.7	2	
PYROLYSIS	A C	4.8	7.8	6.3	4	
COMPOSTING	A C	4.2	7.8	6.0	6	
BALING	B	4.0	7.8	5.9	7	
INCINERATION	A C	6.2	6.2	6.2	5	
SANITARY LANDFILL	B	5.8	7.4	6.6	3	
SEA DISPOSAL	B	4.3	4.2	4.3	8	

PRE-PROCESSES: A - SEPARATION, B - COMPACTION, C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	58	C-58	

1 MATERIAL DESCRIPTION	
CATEGORY	PLASTIC
NAME	IONOMER
COMMON NAME (FORM)	SURLYN (FOAM)
USES	CUSHIONING
FEDERAL/ MILITARY SPECIFICATION NUMBER	-
COMPOSITION	-

2 CHEMICAL PROPERTIES	
MELTING TEMPERATURE	280-350 °F
COMBUSTION TEMPERATURE	625 °F
HEAT OF COMBUSTION	16,000 BTU/LB
MATERIAL DENSITY	56.03-59.90 LB/CU.FT.
BULK DENSITY	5-10 LB/CU.FT.

3 CHARACTERISTICS	
FRAGMENTABILITY	GOOD
SEPARABILITY	POOR
COMPACTIBILITY	GOOD
COMBUSTIBILITY	FAIR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	3.0	10.0	6.5	3	
RECYCLE	A B	4.0	9.0	6.5	3	
PYROLYSIS	A C	4.6	7.6	6.2	4	
COMPOSTING	A C	4.0	7.8	5.9	5	
BALING	B	6.6	7.6	7.2	1	
INCINERATION	A C	6.1	6.3	6.2	4	
SANITARY LANDFILL	B	5.6	7.4	6.6	2	
SEA DISPOSAL	B	4.3	4.2	4.3	6	

PRE-PROCESSES: A = SEPARATION, B = COMPACTION, C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE NO.	OTHER
59	C-59	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	PHENOLICS (PHENOL-FORMALDEHYDE)
COMMON NAME (FORM)	BAKELITE (SOLID STOCK)
USES	TRAYS, CONTAINERS
FEDERAL/ MILITARY SPECIFICATION NUMBER	MIL-R-3745 L-P-1125
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	290-380 °F
COMBUSTION TEMPERATURE	840 °F
HEAT OF COMBUSTION	12,000 BTU/LB
MATERIAL DENSITY	80-85 LB/CU.FT.
BULK DENSITY	2-22 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	FAIR
COMPACTIBILITY	GOOD
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	POOR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	4.5	10.0	7.3	1	
RECYCLE	A B	2.6	9.0	5.8	6	
PYROLYSIS	A C	4.8	7.8	6.3	4	
COMPOSTING	A C	4.2	7.8	6.0	5	
BALING	B	6.2	7.8	7.0	2	
INCINERATION	A C	5.2	6.2	5.7	7	
SANITARY LANDFILL	B	6.4	7.4	6.9	3	
SEA DISPOSAL	B	4.9	4.2	4.6	8	

PRE-PROCESSING: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES AND OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	60	C-80	

1 MATERIAL DESCRIPTION	
CATEGORY	PLASTIC
NAME	PLAST:C/FOIL LAMINATION
COMMON NAME (FORM)	POLYOLEFIN/ALUMINUM/ POLYESTER, MARPLEX (SHEET
USES	WRAPPING, POUCHES
FEDERAL/ MILITARY SPECIFICATION NUMBER	-
COMPOSITION	-

2 CHEMICAL PROPERTIES	
MELTING TEMPERATURE	300-400 ^{o}F
COMBUSTION TEMPERATURE	700-[illegible] ^{o}F
HEAT OF COMBUSTION	18,000-20,000 BTU/LB
MATERIAL DENSITY	80-90 LB/CU.FT.
BULK DENSITY	60-90 LB/CU.FT.

3 CHARACTERISTICS	
FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	2.0	10.0	6.0	4	
RECYCLE	A B	1.6	9.0	5.4	7	
PYROLYSIS	A C	4.6	7.8	6.2	3	
COMPOSTING	A C	4.0	7.6	5.9	5	
BALING	B	5.2	7.8	6.5	2	
INCINERATION	A C	5.2	6.2	5.7	6	
SANITARY LANDFILL	B	5.[illegible]	7.4	6.7	1	
SEA DISPOSAL	B	4.4	4.2	4.3	8	

PRE-PROCESSES: A = SEPARATION; B = COMPACTION; C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	61	C-61	

1 MATERIAL DESCRIPTION	
CATEGORY	PLASTIC
NAME	POLYACRYLICS
COMMON NAME (FORM)	LUCITE, PLEXIGLAS (SOLID STOCK, SHEET)
USES	CONTAINERS
FEDERAL/ MILITARY SPECIFICATION NUMBER	L-P-507 MIL-P-8184
COMPOSITION	-

2 CHEMICAL PROPERTIES	
MELTING TEMPERATURE	300-425 °F
COMBUSTION TEMPERATURE	ABOVE 700 °F
HEAT OF COMBUSTION	15,770 BTU/LB
MATERIAL DENSITY	66.64-74.88 LB/CU.FT.
BULK DENSITY	2-20 LB/CU.FT.

3 CHARACTERISTICS	
FRAGMENTABILITY	GOOD
SEPARABILITY	FAIR
COMPACTIBILITY	GOOD
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	POOR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	4.5	10.0	7.3	2	
RECYCLE	A B	4.4	9.0	6.7	3	
PYROLYSIS	A C	4.8	7.8	6.3	4	
COMPOSTING	A C	4.2	7.8	6.0	5	
BALING	B	7.2	7.6	7.5	1	
INCINERATION	A C	5.7	6.2	6.0	5	
SANITARY LANDFILL	B	6.0	7.4	6.7	3	
SEA DISPOSAL	B	4.5	4.2	4.4	6	

PRE-PROCESSES A = SEPARATION
B = COMPACTION
C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES AND OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	62	C-62	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	POLYAMIDS
COMMON NAME (FORM)	NYLON (CLOTH)
USES	SACKS
FEDERAL/ MILITARY SPECIFICATION NUMBER	MIL-C-81268
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	520-700 °F
COMBUSTION TEMPERATURE	- °F
HEAT OF COMBUSTION	12,000-13,500 BTU/LB
MATERIAL DENSITY	64.89-84.24 LB/CU.FT.
BULK DENSITY	60-84 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	UNSATISFACTORY
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	POOR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	3.0	10.0	6.5	2	
RECYCLE	A B	3.6	9.0	6.3	3	
PYROLYSIS	A C	4.6	7.8	8.2	4	
COMPOSTING	A C	4.0	7.8	5.9	5	
BALING	B	5.2	7.8	6.5	2	
INCINERATION	A C	4.7	8.2	5.5	6	
SANITARY LANDFILL	B	5.9	7.4	6.7	1	
SEA DISPOSAL	B	4.4	4.2	4.3	7	

PRE-PROCESSES: A = SEPARATION
B = COMPACTION
C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	63	C-63	

1	MATERIAL DESCRIPTION
CATEGORY	PLASTIC
NAME	POLYAMIDS
COMMON NAME (FORM)	NYLON (FIBER)
USES	CORD
FEDERAL/ MILITARY SPECIFICATION NUMBER	MIL-C-5040
COMPOSITION	-

2	CHEMICAL PROPERTIES
MELTING TEMPERATURE	520-700 °F
COMBUSTION TEMPERATURE	- °F
HEAT OF COMBUSTION	12,000-13,500 BTU/LB
MATERIAL DENSITY	64.69-84.24 LB/CU.FT.
BULK DENSITY	60-80 LB/CU.FT.

3	CHARACTERISTICS
FRAGMENTABILITY	GOOD
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	UNSATISFACTORY
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	2.0	10.0	6.0	5	
RECYCLE	A B	3.6	9.0	6.3	3	
PYROLYSIS	A C	4.6	7.8	6.2	4	
COMPOSTING	A C	4.0	7.8	5.9	6	
BALING	B	5.2	7.8	6.5	2	
INCINERATION	A C	4.7	6.2	5.5	7	
SANITARY LANDFILL	B	5.9	7.4	6.7	1	
SEA DISPOSAL	B	4.4	4.2	4.3	8	

PRE-PROCESSES: A = SEPARATION
B = COMPACTION
C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	64	C-64	

1 MATERIAL DESCRIPTION	
CATEGORY	PLASTIC
NAME	POLYCARBONATE
COMMON NAME (FORM)	POLYCARBONATE (SHEET)
USES	WRAPPING
FEDERAL/MILITARY SPECIFICATION NUMBER	MIL-P-46144 MIL-P-83310
COMPOSITION	COMMERCIAL QUALITY 3 MILS AND UNDER

2 CHEMICAL PROPERTIES	
MELTING TEMPERATURE	480-650 °F
COMBUSTION TEMPERATURE	780-800 °F
HEAT OF COMBUSTION	18,000 BTU/LB
MATERIAL DENSITY	74.88-93.80 LB/CU.FT.
BULK DENSITY	70-90 LB/CU.FT.

3 CHARACTERISTICS	
FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	FAIR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	2.0	10.0	6.0	5	
RECYCLE	A B	3.6	9.0	8.3	3	
PYROLYSIS	A C	4.8	7.8	6.2	4	
COMPOSTING	A C	4.0	7.8	5.9	6	
BALING	B	5.2	7.8	6.5	2	
INCINERATION	A C	6.7	6.2	6.5	2	
SANITARY LANDFILL	B	5.9	7.4	6.7	1	
SEA DISPOSAL	B	4.4	4.2	4.3	7	

PRE-PROCESSES: A - SEPARATION, B - COMPACTION, C - SHREDDING

5* SPECIAL PRECAUTIONS/APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
65	C-65	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	POLYCARBONATE
COMMON NAME (FORM)	POLYCARBONATE (SOLID STOCK)
USES	CONTAINERS
FEDERAL/ MILITARY SPECIFICATION NUMBER	-
COMPOSITION	UNFILLED TO LESS THAN 10% GLASS FILLED

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	480-650 °F
COMBUSTION TEMPERATURE	780-800 °F
HEAT OF COMBUSTION	16,000 BTU/LB
MATERIAL DENSITY	74.88-93.60 LB/CU.FT.
BULK DENSITY	2-5 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	FAIR
COMPACTIBILITY	GOOD
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	POOR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	4.5	10.0	7.3	2	
RECYCLE	A B	4.4	9.0	8.7	4	
PYROLYSIS	A C	4.8	7.8	6.3	5	
COMPOSTING	A C	4.2	7.8	6.0	6	
BALING	B	7.0	7.8	7.4	1	
INCINERATION	A C	5.2	6.2	5.7	7	
SANITARY LANDFILL	B	6.2	7.4	6.8	3	
SEA DISPOSAL	B	4.7	4.2	4.5	8	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	66	C-66	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	POLYESTER
COMMON NAME (FORM)	DACRON (FIBER)
USES	STRAPS
FEDERAL/ MILITARY SPECIFICATION NUMBER	-
COMPOSITION	GLASS REINFORCED WOVEN CLOTH

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	300-450 °F
COMBUSTION TEMPERATURE	750-800 °F
HEAT OF COMBUSTION	12,000 BTU/LB
MATERIAL DENSITY	93.60-121.04 LB/CU.FT.
BULK DENSITY	90-130 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	[illegible]
COMBUSTIBILITY	GOOD
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	2.0	10.0	6.0	6	
RECYCLE	A B	3.6	9.0	6.3	4	
PYROLYSIS	A C	4.6	7.6	6.2	5	
COMPOSTING	A C	4.0	7.8	5.9	7	
BALING	B	5.2	7.8	6.5	3	
INCINERATION	A C	7.7	6.2	7.0	1	
SANITARY LANDFILL	B	6.3	7.4	6.9	2	
SEA DISPOSAL	B	4.6	4.2	4.5	8	

PRE-PROCESSES: A = SEPARATION
B = COMPACTION
C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
67	C-67	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	POLYESTER
COMMON NAME (FORM)	MYLAR (FILM)
USES	POUCHES
FEDERAL/ MILITARY SPECIFICATION NUMBER	L-P-377
COMPOSITION	GLASS REINFORCED WOVEN CLOTH

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	480-509 °F
COMBUSTION TEMPERATURE	760-800 °F
HEAT OF COMBUSTION	12,000 BTU/LB
MATERIAL DENSITY	93.60-131.04 LB/CU.FT.
BULK DENSITY	90-130 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	GOOD
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PRO-CESS	OPERA-TIONAL RATING	ENVIRON-MENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECO-NOMIC RANKING*
REUSE	A	2.0	10.0	6.0	6	
RECYCLE	A B	3.6	9.0	6.3	4	
PYROLYSIS	A C	4.6	7.8	6.2	5	
COMPOSTING	A C	4.0	7.6	5.9	7	
BALING	B	5.2	7.8	6.5	3	
INCINERATION	A C	7.7	6.2	7.0	1	
SANITARY LANDFILL	B	6.3	7.4	6.9	2	
SEA DISPOSAL	B	4.8	4.2	4.5	8	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	66	C-68	

1 MATERIAL DESCRIPTION	
CATEGORY	PLASTIC
NAME	POLYOLEFIN
COMMON NAME (FORM)	POLYETHYLENE (FILM)
USES	WRAPPING, POUCHES
FEDERAL/ MILITARY SPECIFICATION NUMBER	L-P-378
COMPOSITION	COMMERCIAL PACKING QUALITY (3MILS AND UNDER)

2 CHEMICAL PROPERTIES	
MELTING TEMPERATURE	300-600 °F
COMBUSTION TEMPERATURE	660 °F
HEAT OF COMBUSTION	16,500-19,500 BTU/LB
MATERIAL DENSITY	56.78-60.22 LB/CU.FT.
BULK DENSITY	50-60 LB/CU.FT.

3 CHARACTERISTICS	
FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	FAIR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY						
METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	2.0	10.0	6.0	5	
RECYCLE	A B	3.6	9.0	6.3	3	
PYROLYSIS	A C	4.6	7.6	6.2	4	
COMPOSTING	A C	4.0	7.6	5.9	6	
BALING	B	5.0	7.8	6.4	2	
INCINERATION	A C	6.7	6.2	6.5	1	
SANITARY LANDFILL	B	5.5	7.4	6.5	1	
SEA DISPOSAL	B	4.0	4.2	4.1	7	

PRE-PROCESSES: A = SEPARATION, B = COMPACTION, C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
69	C-69	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	POLYOLEFIN
COMMON NAME (FORM)	POLYETHYLENE (SOLID STOCK)
USES	CONTAINERS
FEDERAL/ MILITARY SPECIFICATION NUMBER	MIL-D-40030
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	300-600 °F
COMBUSTION TEMPERATURE	660 °F
HEAT OF COMBUSTION	18,500-19,500 BTU/LB
MATERIAL DENSITY	56.76-60.22 LB/CU.FT.
BULK DENSITY	2-6 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	FAIR
COMPACTIBILITY	GOOD
COMBUSTIBILITY	FAIR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	POOR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	4.5	10.0	7.3	2	
RECYCLE	A B	4.4	9.0	6.7	3	
PYROLYSIS	A C	4.6	7.8	6.3	6	
COMPOSTING	A C	4.2	7.6	6.0	7	
BALING	B	7.0	7.8	7.4	1	
INCINERATION	A C	6.7	6.2	6.5	5	
SANITARY LANDFILL	B	5.6	7.4	6.6	4	
SEA DISPOSAL	B	4.3	4.2	4.3	8	

PRE-PROCESSES: A = SEPARATION
B = COMPACTION
C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
70	C-70	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	POLYOLEFIN
COMMON NAME (FORM)	POLYPROPYLENE (FIBER)
USES	CORD
FEDERAL/MILITARY SPECIFICATION NUMBER	MIL-R-2:049
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	400-550 °F
COMBUSTION TEMPERATURE	640 °F
HEAT OF COMBUSTION	16,500-19,500 BTU/LB
MATERIAL DENSITY	57.02 LB/CU.FT.
BULK DENSITY	57 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	FAIR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	2.0	10.0	6.0	4	
RECYCLE	A B	3.6	9.0	6.3	2	
PYROLYSIS	A C	4.6	7.8	6.2	3	
COMPOSTING	A C	4.0	7.8	5.9	5	
BALING	B	5.2	7.8	6.5	1	
INCINERATION	A C	6.7	6.2	6.5	1	
SANITARY LANDFILL	B	5.5	7.4	6.5	1	
SEA DISPOSAL	B	4.0	4.2	4.1	6	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/APPLICABLE REGULATIONS

PRODUCES OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE NO.	OTHER
	71	C-71	

1 MATERIAL DESCRIPTION	
CATEGORY	PLASTIC
NAME	POLYOLEFIN
COMMON NAME (FORM)	POLYPROPYLENE (FILM)
USES	WRAPPING, POUCHES
FEDERAL/MILITARY SPECIFICATION NUMBER	L-P-376
COMPOSITION	-

2 CHEMICAL PROPERTIES	
MELTING TEMPERATURE	400-550 °F
COMBUSTION TEMPERATURE	640 °F
HEAT OF COMBUSTION	20,000 BTU/LB
MATERIAL DENSITY	57.02 LB/CU.FT.
BULK DENSITY	50-60 LB/CU.FT.

3 CHARACTERISTICS	
FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	FAIR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	2.5	10.0	6.3	3	
RECYCLE	A B	3.6	9.0	6.3	3	
PYROLYSIS	A C	4.6	7.6	6.2	4	
COMPOSTING	A C	4.0	7.6	5.9	5	
BALING	B	5.6	7.8	6.7	1	
INCINERATION	A C	6.7	6.2	6.5	2	
SANITARY LANDFILL	B	5.5	7.4	6.5	2	
SEA DISPOSAL	B	4.0	4.2	4.1	6	

PRE-PROCESSES: A - SEPARATION
B - COMPACTION
C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	72	C-72	

1 MATERIAL DESCRIPTION	
CATEGORY	PLASTIC
NAME	POLYOLEFIN
COMMON NAME (FORM)	POLYPROPYLENE (FOAM)
USES	CUSHIONING
FEDERAL/MILITARY SPECIFICATION NUMBER	MIL-C-81823
COMPOSITION	-

2 CHEMICAL PROPERTIES	
MELTING TEMPERATURE	400-880 °F
COMBUSTION TEMPERATURE	640 °F
HEAT OF COMBUSTION	20,000 BTU/LB
MATERIAL DENSITY	35 LB/CU.FT.
BULK DENSITY	.4-.9 LB/CU.FT.

3 CHARACTERISTICS	
FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	FAIR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	3.0	10.0	6.8	2	
RECYCLE	A B	4.0	9.0	8.5	2	
PYROLYSIS	A C	4.8	7.8	8.3	3	
COMPOSTING	A C	4.2	7.8	8.0	4	
BALING	B	8.2	7.8	8.0	1	
INCINERATION	A C	8.8	8.2	8.5	2	
SANITARY LANDFILL	B	8.8	7.4	8.5	2	
SEA DISPOSAL	B	4.0	4.2	4.1	5	

PRE-PROCESSES: A - SEPARATION, B - COMPACTION, C - SHREDDING

5* SPECIAL PRECAUTIONS/APPLICABLE REGULATIONS

PREODUCES OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE NO.	OTHER
73	C-73	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	POLYOLEFIN
COMMON NAME (FORM)	POLYPROPYLENE (SOLID STOC
USES	CONTAINERS
FEDERAL/MILITARY SPECIFICATION NUMBER	L-P-393 L-P-394
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	400-550 °F
COMBUSTION TEMPERATURE	640 °F
HEAT OF COMBUSTION	20,000 BTU/LB
MATERIAL DENSITY	57.02 LB/CU.FT.
BULK DENSITY	5-10 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	FAIR
COMPACTIBILITY	GOOD
COMBUSTIBILITY	FAIR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	POOR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	4.5	10.0	7.3	1	
RECYCLE	A B	4.4	9.0	6.7	3	
PYROLYSIS	A C	4.6	7.6	6.3	6	
COMPOSTING	A C	4.2	7.6	6.0	7	
BALING	B	6.6	7.6	7.2	2	
INCINERATION	A C	6.7	6.2	6.5	5	
SANITARY LANDFILL	B	5.8	7.4	6.6	4	
SEA DISPOSAL	B	4.3	4.2	4.3	8	

PRE-PROCESSES: A = SEPARATION
B = COMPACTION
C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	74	C-74	

1	MATERIAL DESCRIPTION
CATEGORY	PLASTIC
NAME	POLYSTYRENE
COMMON NAME (FORM)	POLYSTYRENE (SHEET, FILM)
USES	WRAPPING
FEDERAL/ MILITARY SPECIFICATION NUMBER	L-P-506
COMPOSITION	-

2	CHEMICAL PROPERTIES
MELTING TEMPERATURE	375-500 °F
COMBUSTION TEMPERATURE	660 °F
HEAT OF COMBUSTION	17,000-17,500 BTU/LB
MATERIAL DENSITY	64.90-66.02 LB/CU.FT.
BULK DENSITY	60-70 LB/CU.FT.

3	CHARACTERISTICS
FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	FAIR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY						
METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	2.0	10.0	6.0	6	
RECYCLE	A B	3.6	9.0	6.3	4	
PYROLYSIS	A C	4.6	7.6	6.2	5	
COMPOSTING	A C	4.0	7.6	5.9	7	
BALING	B	5.6	7.6	6.7	1	
INCINERATION	A C	6.7	6.2	6.5	3	
SANITARY LANDFILL	B	5.7	7.4	6.6	2	
SEA DISPOSAL	B	4.2	4.2	4.2	6	

PRE-PROCESSES A = SEPARATION
B = COMPACTION
C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
75	C-75	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	POLYSTYRENE
COMMON NAME (FORM)	POLYSTYRENE (SOLID STOCK)
USES	CONTAINERS, MOLDED PARTS, SHEETING
FEDERAL/ MILITARY SPECIFICATION NUMBER	L-P-396
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	375-500 °F
COMBUSTION TEMPERATURE	680 °F
HEAT OF COMBUSTION	17,000-17,500 BTU/LB
MATERIAL DENSITY	64.90-68.02 LB/CU.FT.
BULK DENSITY	6-15 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	FAIR
COMPACTIBILITY	GOOD
COMBUSTIBILITY	FAIR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	POOR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	4.5	10.0	7.3	1	
RECYCLE	A B	4.4	9.0	8.7	3	
PYROLYSIS	A C	4.8	7.8	6.3	5	
COMPOSTING	A C	4.2	7.8	6.0	6	
BALING	B	6.2	7.6	7.0	2	
INCINERATION	A C	8.7	6.2	6.5	4	
SANITARY LANDFILL	B	6.0	7.4	6.7	3	
SEA DISPOSAL	B	4.5	4.2	4.4	7	

PRE-PROCESSES: A = SEPARATION
B = COMPACTION
C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES AND OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	76	C-76	

1 MATERIAL DESCRIPTION	
CATEGORY	PLASTIC
NAME	POLYSTYRENE
COMMON NAME (FORM)	STYROFOAM (FOAM)
USES	CONTAINERS
FEDERAL/ MILITARY SPECIFICATION NUMBER	-
COMPOSITION	-

2 CHEMICAL PROPERTIES	
MELTING TEMPERATURE	375-500 °F
COMBUSTION TEMPERATURE	680 °F
HEAT OF COMBUSTION	17,000-17,500 BTU/LB
MATERIAL DENSITY	64.90-66.02 LB/CU.FT.
BULK DENSITY	1-3 LB/CU.FT.

3 CHARACTERISTICS	
FRAGMENTABILITY	GOOD
SEPARABILITY	FAIR
COMPACTIBILITY	GOOD
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	POOR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	4.5	10.0	7.3	1	
RECYCLE	A B	4.4	9.0	6.7	3	
PYROLYSIS	A C	4.8	7.8	6.3	4	
COMPOSTING	A C	4.2	7.8	6.0	5	
BALING	B	8.4	7.6	7.1	2	
INCINERATION	A C	5.2	6.2	5.7	6	
SANITARY LANDFILL	B	6.0	7.4	6.7	3	
SEA DISPOSAL	B	4.5	4.2	4.4	7	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES AND OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
77	C-77	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	POLYSTYRENE
COMMON NAME (FORM)	STYROFOAM (FOAM)
USES	CUSHIONING
FEDERAL/ MILITARY SPECIFICATION NUMBER	PPP-C-850
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	375-500 °F
COMBUSTION TEMPERATURE	880 °F
HEAT OF COMBUSTION	17,000-17,500 BTU/LB
MATERIAL DENSITY	64.90-68.02 LB/CU.FT.
BULK DENSITY	.4-1.2 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	3.0	10.0	6.5	3	
RECYCLE	A B	4.0	9.0	8.5	3	
PYROLYSIS	A C	4.8	7.8	8.3	4	
COMPOSTING	A C	4.2	7.8	8.0	5	
BALING	B	8.4	7.8	7.1	1	
INCINERATION	A C	5.3	6.2	5.8	6	
SANITARY LANDFILL	B	5.7	7.4	8.6	2	
SEA DISPOSAL	B	4.2	4.2	4.2	7	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES AND OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	76	C-78	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	POLYSTYRENE
COMMON NAME (FORM)	STYROFOAM (PELLETS)
USES	DUNNAGE
FEDERAL/ MILITARY SPECIFICATION NUMBER	MIL-P-19644
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	375-500	°F
COMBUSTION TEMPERATURE	660	°F
HEAT OF COMBUSTION	17,000-17,500	BTU/LB
MATERIAL DENSITY	64.90-68.02	LB/CU.FT.
BULK DENSITY	1-3	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	2.0	10.0	6.0	5	
RECYCLE	A B	3.6	9.0	6.3	3	
PYROLYSIS	A C	4.8	7.6	6.2	4	
COMPOSTING	A C	4.0	7.8	5.9	6	
BALING	B	6.4	7.8	7.1	1	
INCINERATION	A C	5.2	8.2	5.7	7	
SANITARY LANDFILL	B	5.7	7.4	6.6	2	
SEA DISPOSAL	B	4.2	4.2	4.2	8	

PRE-PROCESSES: A = SEPARATION
B = COMPACTION
C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HARMFUL GASES AND OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
79	C-79	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	POLYSULPHONE
COMMON NAME (FORM)	POLYSULPHONE (SOLID STOCK)
USES	TRAYS, CONTAINERS
FEDERAL/MILITARY SPECIFICATION NUMBER	MIL-P-48120
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	650-750 °F
COMBUSTION TEMPERATURE	- °F
HEAT OF COMBUSTION	8000-11,000 BTU/LB
MATERIAL DENSITY	77.38 LB/CU.FT.
BULK DENSITY	2-5 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	FAIR
COMPACTIBILITY	GOOD
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	POOR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	4.5	10.0	7.3	2	
RECYCLE	A B	4.4	9.0	6.7	3	
PYROLYSIS	A C	4.8	7.8	6.3	4	
COMPOSTING	A C	4.2	7.8	6.0	5	
BALING	B	7.0	7.8	7.4	1	
INCINERATION	A C	5.2	6.2	5.7	6	
SANITARY LANDFILL	B	6.0	7.4	6.7	3	
SEA DISPOSAL	B	4.5	4.2	4.4	7	

PRE-PROCESSES: A - SEPARATION
B - COMPACTION
C - SHREDDING

5* SPECIAL PRECAUTIONS/APPLICABLE REGULATIONS

PRODUCES OXIDES OF SULPHUR IN CONJUNCTION WITH OTHER HARMFUL GASES WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	80	C-80	

1	MATERIAL DESCRIPTION
CATEGORY	PLASTIC
NAME	POLYTETRAFLUOROETHYLENE
COMMON NAME (FORM)	TEFLON, TFE-FLUOROCARBON RESIN (SHEET)
USES	WRAPPING
FEDERAL/ MILITARY SPECIFICATION NUMBER	MIL-P-22241
COMPOSITION	-

2	CHEMICAL PROPERTIES	
MELTING TEMPERATURE	620	°F
COMBUSTION TEMPERATURE	-	°F
HEAT OF COMBUSTION	-	BTU/LB
MATERIAL DENSITY	120-130	LB/CU.FT.
BULK DENSITY	100-130	LB/CU.FT.

3	CHARACTERISTICS
FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	UNSATISFACTORY
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4	DISPOSAL RATING SUMMARY					
METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	2.0	10.0	6.0	5	
RECYCLE	A B	3.6	9.0	6.3	3	
PYROLYSIS	A C	4.6	7.8	6.2	4	
COMPOSTING	A C	4.0	7.8	5.9	6	
BALING	B	5.6	7.8	6.7	2	
INCINERATION	A C	4.7	6.2	5.5	7	
SANITARY LANDFILL	B	6.3	7.4	6.9	1	
SEA DISPOSAL	B	4.8	4.2	4.5	6	

PRE-PROCESSES: A = SEPARATION, B = COMPACTION, C = SHREDDING

5*	SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS
PRODUCES HALOGENATED COMPOUNDS WHEN INCINERATED	

6*	HANDLING DATA
METHOD OF STORAGE/COLLECTION	

8*	OFF-BASE DISPOSAL/ PROCESSING DATA
DISPOSAL/PROCESSING METHOD	
SECONDARY MATERIAL HANDLER	

7*	ON-BASE DISPOSAL/ RECLAMATION DATA
DISPOSAL/RECLAMATION METHOD	

9*	OFF-BASE DISPOSAL/ RECYCLING DATA
DISPOSAL/RECYCLING METHOD	
SECONDARY MATERIAL HANDLER	

10*	NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
81	C-81	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	POLYTETRAFLUOROETHYLENE
COMMON NAME (FORM)	TEFLON (SOLID STOCK)
USES	CONTAINERS
FEDERAL/ MILITARY SPECIFICATION NUMBER	L-P-403
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	620 °F
COMBUSTION TEMPERATURE	- °F
HEAT OF COMBUSTION	- BTU/LB
MATERIAL DENSITY	120-130 LB/CU.FT.
BULK DENSITY	20-30 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	FAIR
COMPACTIBILITY	GOOD
COMBUSTIBILITY	UNSATISFACTORY
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	POOR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	4.5	10.0	7.3	1	
RECYCLE	A B	4.4	9.0	6.7	3	
PYROLYSIS	A C	4.8	7.8	6.3	5	
COMPOSTING	A C	4.2	7.8	6.0	6	
BALING	B	5.2	7.8	6.5	4	
INCINERATION	A C	4.7	6.2	5.5	7	
SANITARY LANDFILL	B	6.6	7.4	7.0	2	
SEA DISPOSAL	B	5.1	4.2	4.7	8	

PRE-PROCESSES: A - SEPARATION
B - COMPACTION
C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HALOGENATED COMPOUNDS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	82	C-82	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	POLYURETHANE
COMMON NAME (FORM)	POLYURETHANE (FILM)
USES	WRAPPING
FEDERAL/ MILITARY SPECIFICATION NUMBER	MIL-P-43604
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	300-375 °F
COMBUSTION TEMPERATURE	700-800 °F
HEAT OF COMBUSTION	11,000-12,000 BTU/LB
MATERIAL DENSITY	69.89-74.88 LB/CU.FT.
BULK DENSITY	60-70 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	FAIR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	2.5	10.0	6.3	4	
RECYCLE	A B	4.0	9.0	6.5	3	
PYROLYSIS	A C	4.8	7.8	6.3	4	
COMPOSTING	A C	4.2	7.8	6.0	5	
BALING	B	5.6	7.8	6.7	1	
INCINERATION	A C	5.3	6.2	5.8	8	
SANITARY LANDFILL	B	5.7	7.4	6.6	2	
SEA DISPOSAL	B	4.2	4.2	4.2	7	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
63	[illegible]-93	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	POLYURETHANE
COMMON NAME (FORM)	POLYURETHANE (FOAM)
USES	CUSHIONING
FEDERAL/ MILITARY SPECIFICATION NUMBER	MIL-P-26514
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	185-350 °F
COMBUSTION TEMPERATURE	700-600 °F
HEAT OF COMBUSTION	11,000-12,000 BTU/LB
MATERIAL DENSITY	65.52-93.60 LB/CU.FT.
BULK DENSITY	.6-30 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	FAIR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	2.5	10.0	6.3	3	
RECYCLE	A B	3.6	9.0	6.3	3	
PYROLYSIS	A C	4.6	7.[illegible]	6.2	4	
COMPOSTING	A C	4.0	7.6	5.9	6	
BALING	B	7.4	7.8	7.6	1	
INCINERATION	A C	5.7	6.2	6.0	5	
SANITARY LANDFILL	B	5.7	7.4	6.6	2	
SEA DISPOSAL	B	4.2	4.2	4.2	7	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	84	C-84	

1 MATERIAL DESCRIPTION	
CATEGORY	PLASTIC
NAME	POLYURETHANE
COMMON NAME (FORM)	POLYURETHANE (SOLID STOCK)
USES	CONTAINERS
FEDERAL/ MILITARY SPECIFICATION NUMBER	MIL-M-24041 MIL-C-36226
COMPOSITION	

2 CHEMICAL PROPERTIES	
MELTING TEMPERATURE	300-375 °F
COMBUSTION TEMPERATURE	700-800 °F
HEAT OF COMBUSTION	11,000-12,000 BTU/LB
MATERIAL DENSITY	65.52-93.60 LB/CU.FT.
BULK DENSITY	2-5 LB/CU.FT.

3 CHARACTERISTICS	
FRAGMENTABILITY	GOOD
SEPARABILITY	FAIR
COMPACTIBILITY	GOOD
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	FAIR
REUSABILITY	POOR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	4.5	10.0	7.3	2	
RECYCLE	A B	4.4	9.0	6.7	4	
PYROLYSIS	A C	4.6	7.6	6.3	5	
COMPOSTING	A C	4.2	7.8	6.0	6	
BALING	B	7.0	7.6	7.4	1	
INCINERATION	A C	5.7	6.2	6.0	6	
SANITARY LANDFILL	B	6.2	7.4	6.6	3	
SEA DISPOSAL	B	4.7	4.2	4.5	7	

PRE-PROCESSES: A - SEPARATION, B - COMPACTION, C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
85	C-85	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	POLYVINYL ALCOHOL
COMMON NAME (FORM)	PVA (SHEET)
USES	WRAPPING
FEDERAL/MILITARY SPECIFICATION NUMBER	-
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	375-490	°F
COMBUSTION TEMPERATURE	680	°F
HEAT OF COMBUSTION	10,760	BTU/LB
MATERIAL DENSITY	75.50-81.74	LB/CU.FT.
BULK DENSITY	20-60	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	FAIR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	2.0	10.0	6.0	8	
RECYCLE	A B	3.6	9.0	6.3	4	
PYROLYSIS	A C	4.6	7.8	6.2	5	
COMPOSTING	A C	4.0	7.8	5.9	7	
BALING	B	6.0	7.8	6.9	1	
INCINERATION	A C	6.7	8.2	6.5	3	
SANITARY LANDFILL	B	5.9	7.4	6.7	2	
SEA DISPOSAL	B	4.4	4.2	4.3	8	

PRE-PROCESSES A = SEPARATION
B = COMPACTION
C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	86	C-86	

1	MATERIAL DESCRIPTION
CATEGORY	PLASTIC
NAME	POLYVINYI ACETATE
COMMON NAME (FORM)	PVAC (SHEET)
USES	WRAPPING
FEDERAL/ MILITARY SPECIFICATION NUMBER	L-P-535
COMPOSITION	-

2	CHEMICAL PROPERTIES
MELTING TEMPERATURE	365-400 °F
COMBUSTION TEMPERATURE	700 °F
HEAT OF COMBUSTION	6830 BTU/LB
MATERIAL DENSITY	64.90-68.84 LB/CU.FT.
BULK DENSITY	20-60 LB/CU.FT.

3	CHARACTERISTICS
FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	2.0	10.0	6.0	5	
RECYCLE	A B	3.6	9.0	6.3	3	
PYROLYSIS	A C	4.6	7.8	6.2	4	
COMPOSTING	A C	4.0	7.8	5.9	6	
BALING	B	6.0	7.6	8.9	1	
INCINERATION	A C	5.2	6.2	5.7	7	
SANITARY LANDFILL	B	5.7	7.4	6.6	2	
SEA DISPOSAL	B	4.2	4.2	4.2	6	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
87	C-87	

1 MATERIAL DESCRIPTION

CATEGORY	PLASTIC
NAME	POLYVINYL CHLORIDE
COMMON NAME (FORM)	PVC (SHEET)
USES	WRAPPING, POUCHES, WATERPROOF COVERS
FEDERAL/ MILITARY SPECIFICATION NUMBER	L-P-375
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	300-350 °F
COMBUSTION TEMPERATURE	700-800 °F
HEAT OF COMBUSTION	7500-9000 BTU/LB
MATERIAL DENSITY	80-90 LB/CU.FT.
BULK DENSITY	20-80 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PRO-CESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	2.0	10.0	6.0	5	
RECYCLE	A B	3.6	9.0	6.3	3	
PYROLYSIS	A C	4.6	7.8	6.2	4	
COMPOSTING	A C	4.0	7.8	5.9	6	
BALING	B	6.0	7.8	6.9	1	
INCINERATION	A C	5.7	6.2	6.0	5	
SANITARY LANDFILL	B	6.1	7.4	6.8	2	
SEA DISPOSAL	B	4.6	4.2	4.4	7	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HCL GAS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	88	C-88	

1	MATERIAL DESCRIPTION
CATEGORY	PLASTIC
NAME	POLYVINYL CHLORIDE
COMMON NAME (FORM)	PVC (SOLID STOCK)
USES	CONTAINERS, BLISTER PACKAGES, LINERS
FEDERAL/MILITARY SPECIFICATION NUMBER	L-P-535
COMPOSITION	-

2	CHEMICAL PROPERTIES
MELTING TEMPERATURE	250-375 °F
COMBUSTION TEMPERATURE	700-800 °F
HEAT OF COMBUSTION	4315 BTU/LB
MATERIAL DENSITY	99.22-108.70 LB/CU.FT.
BULK DENSITY	90-100 LB/CU.FT.

3	CHARACTERISTICS
FRAGMENTABILITY	GOOD
SEPARABILITY	FAIR
COMPACTIBILITY	GOOD
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	POOR

4 DISPOSAL RATING SUMMARY						
METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	4.5	10.0	7.3	1	
RECYCLE	A B	4.4	9.0	8.7	3	
PYROLYSIS	A C	4.8	7.8	6.3	4	
COMPOSTING	A C	4.2	7.8	6.0	5	
BALING	B	5.6	7.8	6.7	3	
INCINERATION	A C	5.7	6.2	6.0	5	
SANITARY LANDFILL	B	8.4	7.4	6.9	2	
SEA DISPOSAL	B	4.9	4.2	4.8	8	

PRE-PROCESSES: A = SEPARATION
B = COMPACTION
C = SHREDDING

5*	SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HYDROCHLORIC ACID GAS WHEN INCINERATED

6*	HANDLING DATA
METHOD OF STORAGE/COLLECTION	

7*	ON-BASE DISPOSAL/ RECLAMATION DATA
DISPOSAL/RECLAMATION METHOD	

8*	OFF-BASE DISPOSAL/ PROCESSING DATA
DISPOSAL/PROCESSING METHOD	
SECONDARY MATERIAL HANDLER	

9*	OFF-BASE DISPOSAL/ RECYCLING DATA
DISPOSAL/RECYCLING METHOD	
SECONDARY MATERIAL HANDLER	

10*	NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
89	C-89	

1 MATERIAL DESCRIPTION	
CATEGORY	PLASTIC
NAME	POLYVINYLIDENE CHLORIDE
COMMON NAME (FORM)	SARAN, PVDC (FILM)
USES	WRAPPING
FEDERAL/ MILITARY SPECIFICATION NUMBER	L-P-370
COMPOSITION	-

2 CHEMICAL PROPERTIES	
MELTING TEMPERATURE	250-375 ^{o}F
COMBUSTION TEMPERATURE	700-800 ^{o}F
HEAT OF COMBUSTION	4315 BTU/LB
MATERIAL DENSITY	99.22-106.70 LB/CU.FT.
BULK DENSITY	80-100 LB/CU.FT.

3 CHARACTERISTICS	
FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	POOR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	3.5	10.0	8.8	2	
RECYCLE	A B	3.8	9.0	6.3	4	
PYROLYSIS	A C	4.8	7.8	6.2	5	
COMPOSTING	A C	4.0	7.8	5.9	6	
BALING	B	5.2	7.8	6.5	3	
INCINERATION	A C	5.2	6.2	5.7	7	
SANITARY LANDFILL	B	6.3	7.4	6.9	1	
SEA DISPOSAL	B	4.8	4.2	4.5	8	

PRE-PROCESSES: A = SEPARATION
B = COMPACTION
C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES HCL GAS AND OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	90	C-90	

1 MATERIAL DESCRIPTION	
CATEGORY	PLASTIC
NAME	RUBBER
COMMON NAME (FORM)	LATEX (FOAM)
USES	CUSHIONING
FEDERAL/ MILITARY SPECIFICATION NUMBER	MIL-R-5001
COMPOSITION	-

2 CHEMICAL PROPERTIES	
MELTING TEMPERATURE	250-400 °F
COMBUSTION TEMPERATURE	- °F
HEAT OF COMBUSTION	11,000 BTU/LB
MATERIAL DENSITY	50-60 LB/CU.FT.
BULK DENSITY	40-60 LB/CU.FT.

3 CHARACTERISTICS	
FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	FAIR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	2.0	10.0	6.0	4	
RECYCLE	A B	1.6	9.0	5.4	6	
PYROLYSIS	A C	4.6	7.6	6.2	3	
COMPOSTING	A C	4.0	7.6	5.9	5	
BALING	B	5.6	7.8	6.7	1	
INCINERATION	A C	6.7	6.2	6.5	2	
SANITARY LANDFILL	B	5.5	7.4	6.5	2	
SEA DISPOSAL	B	4.0	4.2	4.1	7	

PRE-PROCESSES: A - SEPARATION, B - COMPACTION, C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
91	C-91	

1 MATERIAL DESCRIPTION

CATEGORY	TEXTILE
NAME	BOUND FIBER
COMMON NAME (FORM)	RUBBERIZED HAIR (FIBER)
USES	CUSHIONING
FEDERAL/MILITARY SPECIFICATION NUMBER	PPP-C-1120
COMPOSITION	POLYCHLOROPRENE (NEOPRENE)

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	- °F
COMBUSTION TEMPERATURE	680 °F
HEAT OF COMBUSTION	12,500 BTU/LB
MATERIAL DENSITY	78 LB/CU.FT.
BULK DENSITY	10-30 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	UNSATISFACTORY
COMPACTIBILITY	FAIR
COMBUSTIBILITY	FAIR
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	1.5	10.0	5.8	5	
RECYCLE	A B	1.4	9.0	5.2	6	
PYROLYSIS	A	4.2	7.8	6.0	4	
COMPOSTING	A	3.6	7.8	5.8	5	
BALING	B	6.4	7.8	7.1	1	
INCINERATION	A	6.1	6.2	6.2	3	
SANITARY LANDFILL	B	5.9	7.4	6.7	2	
SEA DISPOSAL	B	4.0	4.2	4.1	7	

PRE-PROCESSES: A - SEPARATION, B - COMPACTION, C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
92	C-92	

1 MATERIAL DESCRIPTION

CATEGORY	TEXTILE
NAME	CANVASS, RUBBERIZED
COMMON NAME (FORM)	TARP (CLOTH)
USES	TARPAULIN
FEDERAL/MILITARY SPECIFICATION NUMBER	-
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	- °F
COMBUSTION TEMPERATURE	660 °F
HEAT OF COMBUSTION	12,500 BTU/LB
MATERIAL DENSITY	87 LB/CU.FT.
BULK DENSITY	10-30 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	FAIR
SEPARABILITY	FAIR
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	FAIR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	UNSATISFACTORY
CHEMICAL DEGRADABILITY	UNSATISFACTORY
REUSABILITY	EXCELLENT

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PRO-CESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	8.0	10.0	9.0	1	
RECYCLE	A B	3.0	9.0	6.0	5	
PYROLYSIS	A C	3.6	7.8	5.7	8	
COMPOSTING	A C	3.6	7.8	5.7	6	
BALING	B	7.8	7.8	7.8	2	
INCINERATION	A C	5.7	8.2	6.1	4	
SANITARY LANDFILL	B	6.4	7.4	6.9	3	
SEA DISPOSAL	B	4.9	4.2	4.8	7	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES OFFENSIVE ODORS WHEN INCINERATED

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	93	C-93	

1 MATERIAL DESCRIPTION

CATEGORY	TEXTILE
NAME	COTTON
COMMON NAME (FORM)	COTTON (CLOTH)
USES	CUSHIONING
FEDERAL/ MILITARY SPECIFICATION NUMBER	-
COMPOSITION	CELLULOSE

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	-	°F
COMBUSTION TEMPERATURE	491	°F
HEAT OF COMBUSTION	7652	BTU/LB
MATERIAL DENSITY	95	LB/CU.FT.
BULK DENSITY	70	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	2.5	10.0	8.3	7	
RECYCLE	A B	4.6	9.0	6.9	6	
PYROLYSIS	A	7.6	7.8	7.7	3	
COMPOSTING	A	6.4	7.8	7.1	4	
BALING	B	6.2	7.6	7.0	5	
INCINERATION	A	9.3	6.4	7.9	2	
SANITARY LANDFILL	B	9.4	7.2	8.3	1	
SEA DISPOSAL	B	7.4	4.2	5.8	6	

PRE-PROCESSES A = SEPARATION
B = COMPACTION
C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
94	C-94	

1 MATERIAL DESCRIPTION

CATEGORY	TEXTILE
NAME	COTTON
COMMON NAME (FORM)	COTTON (CLOTH)
USES	RAGS
FEDERAL/ MILITARY SPECIFICATION NUMBER	-
COMPOSITION	CELLULOSE

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	- °F
COMBUSTION TEMPERATURE	491 °F
HEAT OF COMBUSTION	7652 BTU/LB
MATERIAL DENSITY	95 LB/CU.FT.
BULK DENSITY	70 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	POOR
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	FAIR

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	4.0	10.0	7.0	4	
RECYCLE	A B	4.8	9.0	6.9	5	
PYROLYSIS	A C	6.8	7.8	7.3	3	
COMPOSTING	A C	6.0	7.8	6.9	5	
BALING	B	6.2	7.8	7.0	4	
INCINERATION	A C	8.9	6.4	7.7	2	
SANITARY LANDFILL	B	9.2	7.2	8.2	1	
SEA DISPOSAL	B	7.4	4.2	5.8	6	

PRE-PROCESSES: A = SEPARATION, B = COMPACTION, C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
95	C-95	

1 MATERIAL DESCRIPTION

CATEGORY	TEXTILE
NAME	COTTON
COMMON NAME (FORM)	COTTON (CLOTH)
USES	SACKS
FEDERAL/MILITARY SPECIFICATION NUMBER	PPP-B-1358 PPP-B-1087
COMPOSITION	CELLULOSE

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	-	°F
COMBUSTION TEMPERATURE	491	°F
HEAT OF COMBUSTION	7652	BTU/LB
MATERIAL DENSITY	95	LB/CU.FT.
BULK DENSITY	70	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	POOR
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	EXCELLENT

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	6.5	10.0	8.3	1	
RECYCLE	A B	4.8	9.0	6.9	6	
PYROLYSIS	A C	6.8	7.8	7.3	4	
COMPOSTING	A C	6.0	7.8	6.9	6	
BALING	B	6.2	7.8	7.0	5	
INCINERATION	A C	8.9	6.4	7.7	3	
SANITARY LANDFILL	B	9.2	7.2	8.2	2	
SEA DISPOSAL	B	7.4	4.2	5.8	7	

PRE-PROCESSES: A = SEPARATION
B = COMPACTION
C = SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
96	C-96	

1 MATERIAL DESCRIPTION

CATEGORY	TEXTILE
NAME	FELT
COMMON NAME (FORM)	FELT (SHEET)
USES	CUSHIONING
FEDERAL/ MILITARY SPECIFICATION NUMBER	C-F-202 C-F-206
COMPOSITION	FORMATION OF NATURAL JUTE FIBERS WHICH IS COMPOSED OF LIGNO-CELLULOSE

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	-	°F
COMBUSTION TEMPERATURE	510	°F
HEAT OF COMBUSTION	7232	BTU/LB
MATERIAL DENSITY	92	LB/CU.FT.
BULK DENSITY	92	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	2.5	10.0	6.3	7	
RECYCLE	A B	4.8	9.0	6.9	5	
PYROLYSIS	A	7.6	7.8	7.7	3	
COMPOSTING	A	6.4	7.8	7.1	4	
BALING	B	5.8	7.8	6.8	6	
INCINERATION	A	9.3	6.4	7.9	2	
SANITARY LANDFILL	B	9.4	7.2	8.3	1	
SEA DISPOSAL	B	7.4	4.2	5.8	8	

PRE-PROCESSES: A - SEPARATION
B - COMPACTION
C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

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10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
97	C-97	

1 MATERIAL DESCRIPTION

CATEGORY	TEXTILE
NAME	JUTE
COMMON NAME (FORM)	BURLAP (CLOTH)
USES	SACKS
FEDERAL/ MILITARY SPECIFICATION NUMBER	PPP-B-35 CCC-C-457
COMPOSITION	LIGNOCELLULOSE MADE FROM JUTE

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	-	°F
COMBUSTION TEMPERATURE	510	°F
HEAT OF COMBUSTION	7332	BTU/LB
MATERIAL DENSITY	92	LB/CU.FT.
BULK DENSITY	70	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	GOOD
SEPARABILITY	POOR
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	EXCELLENT

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	6.5	10.0	8.3	1	
RECYCLE	A B	4.8	9.0	6.9	6	
PYROLYSIS	A C	6.8	7.8	7.3	4	
COMPOSTING	A C	6.0	7.8	6.9	6	
BALING	B	6.2	7.8	7.0	5	
INCINERATION	A C	8.9	6.4	7.7	3	
SANITARY LANDFILL	B	8.6	7.2	8.0	2	
SEA DISPOSAL	B	7.0	4.2	5.6	7	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

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9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET
SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
98	C-98	

1 MATERIAL DESCRIPTION

CATEGORY	TEXTILE
NAME	SCRIM/FOIL LAMINATION
COMMON NAME (FORM)	POLYOLEFIN/ALUMINUM/ SCRIM (SHEET)
USES	BARRIER MATERIAL
FEDERAL/ MILITARY SPECIFICATION NUMBER	MIL-B-131
COMPOSITION	-

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	1200 °F
COMBUSTION TEMPERATURE	- °F
HEAT OF COMBUSTION	- BTU/LB
MATERIAL DENSITY	60-90 LB/CU.FT.
BULK DENSITY	40-70 LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	FAIR
COMBUSTIBILITY	POOR
TOXICITY	EXCELLENT (SEE PRECAUTIONS)
BIOLOGICAL DEGRADABILITY	POOR
CHEMICAL DEGRADABILITY	POOR
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	2.0	10.0	6.0	4	
RECYCLE	A B	1.8	9.0	5.4	7	
PYROLYSIS	A C	4.6	7.8	6.2	3	
COMPOSTING	A C	4.0	7.8	5.9	5	
BALING	B	5.2	7.8	6.5	2	
INCINERATION	A C	5.2	6.2	5.7	6	
SANITARY LANDFILL	B	5.9	7.4	6.7	1	
SEA DISPOSAL	B	4.4	4.2	4.3	8	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

PRODUCES OFFENSIVE ODORS WHEN INCINERATED.

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

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9* OFF-BASE DISPOSAL/ RECYCLING DATA

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SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	99	C-99	

1	MATERIAL DESCRIPTION
CATEGORY	WOOD
NAME	WOOD
COMMON NAME (FORM)	COOPERAGE (BOARD)
USES	KEGS
FEDERAL/ MILITARY SPECIFICATION NUMBER	NN-K-231 PPP-B-41
COMPOSITION	CELLULOSE (70%) AND LIGNIN (18-28%) SITKA SPRUCE - SOFTWOOD

2	CHEMICAL PROPERTIES
MELTING TEMPERATURE	- °F
COMBUSTION TEMPERATURE	523 °F
HEAT OF COMBUSTION	9150 BTU/LB
MATERIAL DENSITY	28 LB/CU.FT.
BULK DENSITY	8 LB/CU.FT.

3	CHARACTERISTICS
FRAGMENTABILITY	FAIR
SEPARABILITY	GOOD
COMPACTIBILITY	FAIR
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	EXCELLENT

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PRO-CESS	OPERA-TIONAL RATING	ENVIRON-MENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECO-NOMIC RANKING *
REUSE	A	9.0	10.0	9.5	1	
RECYCLE	A B	4.4	9.0	6.7	8	
PYROLYSIS	A C	7.8	7.8	7.7	2	
COMPOSTING	A C	8.0	7.8	6.9	4	
BALING	B	5.8	7.8	6.8	5	
INCINERATION	A C	7.8	6.4	7.1	3	
SANITARY LANDFILL	B	5.0	7.2	6.1	7	
SEA DISPOSAL	B	4.0	4.2	4.1	8	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

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9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	100	C-100	

1	MATERIAL DESCRIPTION
CATEGORY	WOOD
NAME	WOOD
COMMON NAME (FORM)	EXCELSIOR (SHREDS)
USES	DUNNAGE
FEDERAL/ MILITARY SPECIFICATION NUMBER	PPP-E-911
COMPOSITION	CELLULOSE (70%) AND LIGNIN (18-28%) (AMERICAN BASEWOOD - HARDWOOD)

2	CHEMICAL PROPERTIES	
MELTING TEMPERATURE	-	°F
COMBUSTION TEMPERATURE	523	°F
HEAT OF COMBUSTION	8500	BTU/LB
MATERIAL DENSITY	28	LB/CU.FT.
BULK DENSITY	10	LB/CU.FT.

3	CHARACTERISTICS
FRAGMENTABILITY	EXCELLENT
SEPARABILITY	POOR
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	UNSATISFACTORY

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	3.0	10.0	8.5	8	
RECYCLE	A B	2.4	9.0	5.7	7	
PYROLYSIS	A	7.8	7.8	7.7	1	
COMPOSTING	A	8.0	7.8	8.9	5	
BALING	B	8.8	7.8	7.2	4	
INCINERATION	A	8.8	8.4	7.8	2	
SANITARY LANDFILL	B	7.5	7.2	7.4	3	
SEA DISPOSAL	B	5.5	4.2	4.9	3	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

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8* OFF-BASE DISPOSAL/ PROCESSING DATA

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SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

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SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
101	C-101	

1 MATERIAL DESCRIPTION

CATEGORY	WOOD
NAME	WOOD
COMMON NAME (FORM)	PLYWOOD (SHEET)
USES	CRATES
FEDERAL/MILITARY SPECIFICATION NUMBER	NN-P-530
COMPOSITION	CELLULOSE (70%) AND LIGNIN (18-28%) SUGAR PINE - SOFTWOOD

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	-	°F
COMBUSTION TEMPERATURE	523	°F
HEAT OF COMBUSTION	9150	BTU/LB
MATERIAL DENSITY	25	LB/CU.FT.
BULK DENSITY	6	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	FAIR
SEPARABILITY	GOOD
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	EXCELLENT

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	8.5	10.0	9.3	1	
RECYCLE	A B	4.0	9.0	6.5	7	
PYROLYSIS	A C	7.6	7.8	7.7	2	
COMPOSTING	A C	6.0	7.8	6.9	6	
BALING	B	6.4	7.8	7.1	4	
INCINERATION	A C	7.9	6.4	7.2	3	
SANITARY LANDFILL	B	6.7	7.2	7.0	5	
SEA DISPOSAL	B	5.2	4.2	4.7	8	

PRE-PROCESSES: A - SEPARATION; B - COMPACTION; C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

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10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	102	C-102	

1	MATERIAL DESCRIPTION
CATEGORY	WOOD
NAME	WOOD
COMMON NAME (FORM)	VENEER (SHEET)
USES	CRATES
FEDERAL/ MILITARY SPECIFICATION NUMBER	PPP-V-205
COMPOSITION	CELLULOSE (70%) AND LIGNIN (18-28%) PONDEROSA PINE AND JEFFRY PINE - SOFTWOOD

2	CHEMICAL PROPERTIES	
MELTING TEMPERATURE	-	°F
COMBUSTION TEMPERATURE	523	°F
HEAT OF COMBUSTION	9150	BTU/LB
MATERIAL DENSITY	28	LB/CU.FT.
BULK DENSITY	7	LB/CU.FT.

3	CHARACTERISTICS
FRAGMENTABILITY	GOOD
SEPARABILITY	GOOD
COMPACTIBILITY	EXCELLENT
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	EXCELLENT

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING *
REUSE	A	8.0	10.0	9.0	1	
RECYCLE	A B	4.0	9.0	6.5	7	
PYROLYSIS	A C	8.0	7.8	7.9	2	
COMPOSTING	A C	6.8	7.8	7.3	4	
BALING	B	5.4	7.8	6.6	6	
INCINERATION	A C	8.3	6.4	7.4	3	
SANITARY LANDFILL	B	7.2	7.2	7.2	5	
SEA DISPOSAL	B	5.2	4.2	4.7	8	

PRE-PROCESSES: A - SEPARATION, B - COMPACTION, C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE	REFERENCE CODE		
	MATERIAL NO.	REFERENCE PG.	OTHER
	103	C-103	

1	MATERIAL DESCRIPTION
CATEGORY	WOOD
NAME	WOOD
COMMON NAME (FORM)	WOOD (BOARD)
USES	CRATES, PALLETS
FEDERAL/ MILITARY SPECIFICATION NUMBER	PPP-B-821 MIL-P-3938
COMPOSITION	CELLULOSE (70%) AND LIGNIN (1?-28%) LARCH, WESTERN - SOFTWOOD

2	CHEMICAL PROPERTIES	
MELTING TEMPERATURE	-	°F
COMBUSTION TEMPERATURE	523	°F
HEAT OF COMBUSTION	9150	BTU/LB
MATERIAL DENSITY	36	LB/CU.FT.
BULK DENSITY	11	LB/CU.FT.

3	CHARACTERISTICS
FRAGMENTABILITY	FAIR
SEPARABILITY	GOOD
COMPACTIBILITY	FAIR
COMBUSTIBILITY	GOOD
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	EXCELLENT

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	8.5	10.0	9.3	1	
RECYCLE	A B	4.0	9.0	6.5	6	
PYROLYSIS	A C	7.4	7.8	7.6	2	
COMPOSTING	A C	5.8	7.6	8.7	5	
BALING	B	5.8	7.8	6.8	4	
INCINERATION	A C	7.7	8.4	7.1	3	
SANITARY LANDFILL	B	5.2	7.2	8.2	7	
SEA DISPOSAL	B	4.2	4.2	4.2	8	

PRE-PROCESSES: A - SEPARATION
B - COMPACTION
C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

AFTER SHREDDING REMOVE NAILS BY MECHANICAL MEANS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

*TO BE COMPLETED BY THE COGNIZANT OFFICER

SUMMARY FACT SHEET SOLID WASTE

REFERENCE CODE		
MATERIAL NO.	REFERENCE PG.	OTHER
104	C-104	

1 MATERIAL DESCRIPTION

CATEGORY	WOOD
NAME	WOOD/METAL
COMMON NAME (FORM)	NAILED OR WIREBOUND WOOD (BOARD)
USES	CRATES, PALLETS
FEDERAL/ MILITARY SPECIFICATION NUMBER	PPP-B-585 PPP-B-587
COMPOSITION	CELLULOSE (70%) AND LIGNIN (18-28%) INLAND DOUGLAS FIR - SOFTWOOD

2 CHEMICAL PROPERTIES

MELTING TEMPERATURE	-	°F
COMBUSTION TEMPERATURE	523	°F
HEAT OF COMBUSTION	9050	BTU/LB
MATERIAL DENSITY	38	LB/CU.FT.
BULK DENSITY	8	LB/CU.FT.

3 CHARACTERISTICS

FRAGMENTABILITY	UNSATISFACTORY
SEPARABILITY	GOOD
COMPACTIBILITY	FAIR
COMBUSTIBILITY	EXCELLENT
TOXICITY	EXCELLENT
BIOLOGICAL DEGRADABILITY	GOOD
CHEMICAL DEGRADABILITY	EXCELLENT
REUSABILITY	EXCELLENT

4 DISPOSAL RATING SUMMARY

METHOD OF DISPOSAL	PRE-PROCESS	OPERATIONAL RATING	ENVIRONMENTAL RATING	TOTAL DISPOSAL RATING	TOTAL DISPOSAL RANKING	ECONOMIC RANKING*
REUSE	A	8.0	10.0	9.0	1	
RECYCLE	A B	4.0	9.0	6.5	5	
PYROLYSIS	A C	6.4	7.6	7.1	2	
COMPOSTING	A C	5.2	7.6	6.5	5	
BALING	B	6.2	7.8	7.0	3	
INCINERATION	A C	7.1	6.4	8.8	4	
SANITARY LANDFILL	B	5.3	7.2	8.3	8	
SEA DISPOSAL	B	4.5	4.2	4.4	7	

PRE-PROCESSES: A - SEPARATION
B - COMPACTION
C - SHREDDING

5* SPECIAL PRECAUTIONS/ APPLICABLE REGULATIONS

6* HANDLING DATA

METHOD OF STORAGE/COLLECTION

7* ON-BASE DISPOSAL/ RECLAMATION DATA

DISPOSAL/RECLAMATION METHOD

8* OFF-BASE DISPOSAL/ PROCESSING DATA

DISPOSAL/PROCESSING METHOD

SECONDARY MATERIAL HANDLER

9* OFF-BASE DISPOSAL/ RECYCLING DATA

DISPOSAL/RECYCLING METHOD

SECONDARY MATERIAL HANDLER

10* NOTES AND COMMENTS

*TO BE COMPLETED BY THE COGNIZANT OFFICER

DISPOSABILITY CHARACTERISTICS OF MILITARY PACKAGING MATERIALS

FACT SHEETS

This volume contains Fact Sheets on the disposability characteristics of 104 commonly used military packaging materials. Although this list of materials, which includes 87 solids (papers, textiles, woods, plastics, glasses, and metals) and 17 liquids (oils and cleaning fluids), is not meant to be all inclusive, it is representative of the common materials that are used for military packaging purposes. The function of these Fact Sheets is to assist military organizations and installations in the selection of environmentally and economically sound treatment and reclamation or disposal processes.

Each fact sheet includes seven to ten sections containing the following types of information:

- Material description
- Chemical and physical properties
- Treatment and disposal techniques
- Ratings of these techniques
- Listing of special precautions
- Other notes and comments.

Additionally, provision is made to insert applicable information that is specific to a given location.

The information contained in the Fact Sheets was extracted from a detailed limited-circulation report that was presented to U.S. Army Natick Laboratories.

To select a disposal process that will result in minimal pollution of the environment, the Fact Sheet section entitled "Disposal Rating Summary" should be used as a guide (Section 3 for liquids and Section 4

for solids). The column entitled "Total Disposal Ranking" indicates the relative order for selection of the best method of disposal on the basis of the operational and environmental analysis. The best method is given the ranking of 1.

The determination of economic feasibility, which is dependent upon such local factors as availability and efficiency of equipment, transportation costs, market for materials, etc., must be made at the installation level on the basis of life-cycle cost analysis.

APPENDIX A

WASTE MANAGEMENT TECHNOLOGY

This appendix presents a survey of the current status of technology for management of waste packaging materials. It includes all equipment and processes that have been demonstrated to operate successfully, even though some have yet to receive wide acceptance by the sanitation industry.

The general flow diagram for management of packaging waste is shown in Figure A-1. The following discussion describes each block, i.e., process shown in the flow diagram.

1. SEPARATION, STORAGE, REMOVAL AND TRANSPORTATION

The method of storage and handling of each type of packaging waste is determined by its eventual disposition. The discussion here covers source separation, storage, collection, and transportation.

(1) Source Separation

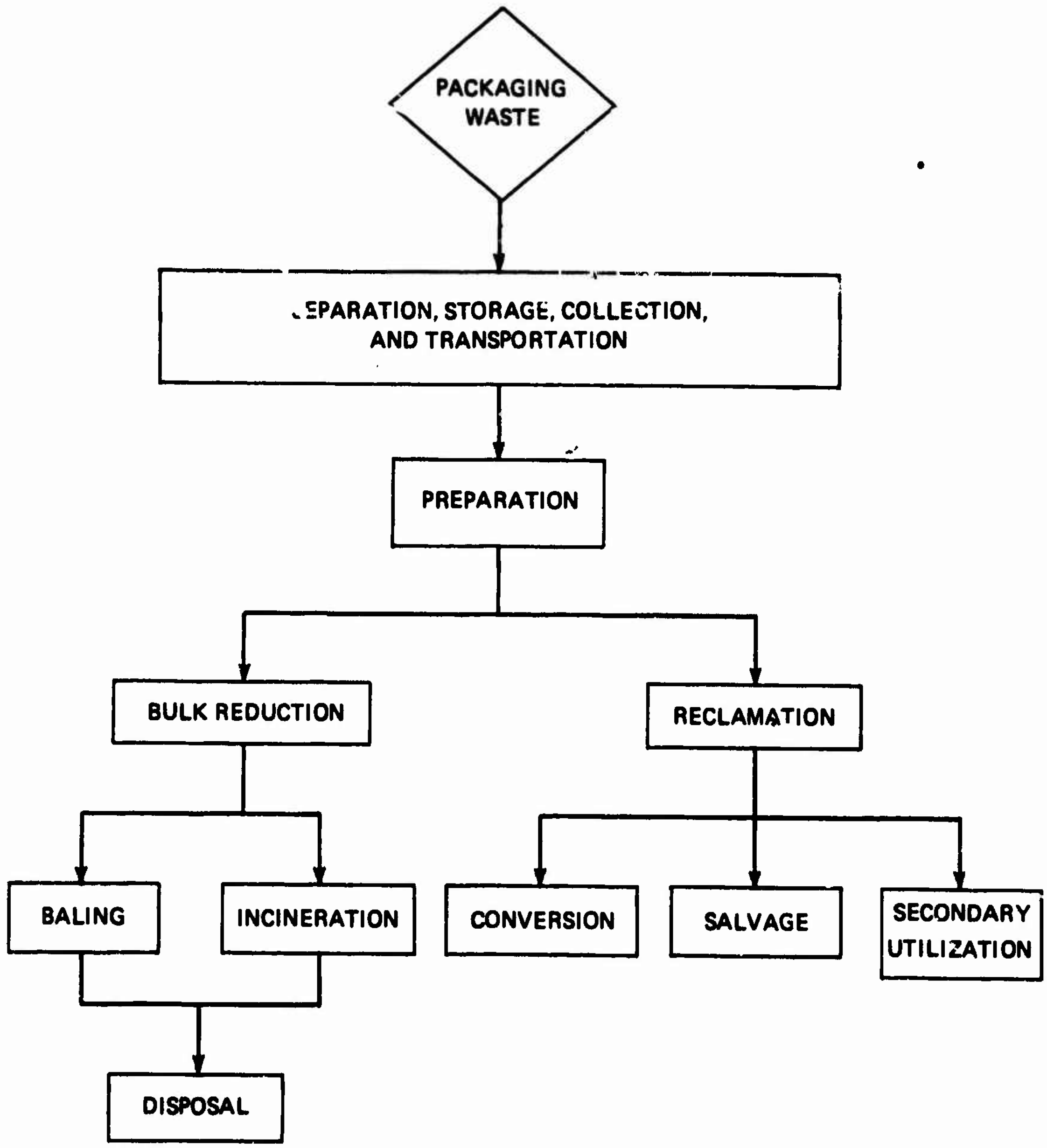
The waste source is the point at which a packaging material becomes a packaging waste which is typically upon opening a package and removing its contents. Source separation refers to the separate storage of materials, when their mixing would interfere with their subsequent disposition.

The most common reason for source separation is the need to minimize contamination of reusable or reclaimable materials. Other materials may interfere with the operation of a specific process. For example, plastics typically clog up incinerator grates, whereas metal bands are likely to jam the mechanism of a hammer mill. Finally, bulky items, such as crates and pallets, frequently must be dismanteled to facilitate subsequent handling.

The requirement for source separation and the recommended storage method are indicated on the Fact Sheet for each material.

APPENDIX A(2)

FIGURE A-1
Flow Diagram for Management
of Solid Packaging Waste



(2) Storage

In a warehouse, or similar facility that handles large amounts of packaging materials, the wastes are typically stored in large metal bins that are mated to collection trucks to facilitate removal. Paper stock and certain other materials slated for reclamation can be bundled for shipping.

Compaction devices designed to reduce storage space requirements are available in various shapes and sizes from some 20 manufacturers. These pack waste materials into large bags or metal containers.

(3) Removal and Transportation

Residential solid waste is usually collected by closed collection vehicles manned by a driver and two loaders. A typical vehicle consists of a closed packer body with a 12- to 20-cu yd capacity, mounted on a regular truck chassis. The body has an opening for loading at the rear, or sometimes at the side, and is equipped with one or two compacting mechanisms that increase the load intake by a factor of 2 to 3.

Collection vehicles serving commercial establishments or military bases are designed to cope with larger containers and are generally manned by a single operator. They fall into four categories:

- Semiautomatic rear loaders, similar to the household refuse collection vehicles, but equipped with a power device for lifting and tipping the containers
- Automatic front loaders that lift the container over the cab and dump its contents into the packer body behind
- Piggyback platforms that lift or pull the full container onto their chassis
- Train tractors— small, powered vehicles that hook up a string of wheeled containers.

Long-distance hauling of solid wastes is effected with the aid of stations that transfer the waste from collection vehicles onto trailer vans, railroad cars, or barges. Modern stations are equipped with a stationary compacting mechanism, and the addition of fragmentation devices is under consideration. The number of transfer stations is expected to grow rapidly as landfills move farther away from populated areas and more favorable cost factors improve their economic feasibility.

2. PREPARATION

Preparation of packaging waste for subsequent processing may take the form of fragmentation or sorting. These steps are useful precursors to a number of subsequent operations, including baling, incineration, pyrolysis, reclamation, and landfill. They are conducted typically at a central processing facility. The requirement for preparatory steps is indicated on each material data sheet.

(1) Fragmentation

Reduction in the average size of the refuse fragment, known as fragmentation, comminution, or presizing, enhances the homogeneity, packing, and handling quality of refuse. The fragmentation mechanisms for the various substances in the refuse stream vary widely and have not been characterized adequately. Hard and brittle materials, such as glass, ceramics and masonry, crush under impact; whereas such soft, elastic, and fibrous materials as metals, plastics, rubber, textiles, wood, and paper are best reduced by a cutting or shearing action. The selection of the most suitable equipment must take into consideration the amount and composition of raw refuse, requirements of subsequent operations, and economic factors.

The most common fragmentation equipment includes hammer mills, shredders, shears, and wet pulpers. Other devices with essentially similar functions are variously known as ball mills, cage disintegrators, chippers, crushers, cutters, disk mills, drum pulverizers, grinders, hoggers, and rasp mills. Hammer mills use a variety of rotating hammers that apply tensile, compressive, and shearing forces to fragmentize a wide mix of refuse. Shredders employ overlapping fingers operating at different speeds to tear and shear fibrous and

ductile materials. Shears are used primarily for breaking up timber, automobile bodies, and other bulky items. Wet pulpers subject a 10 percent slurry of solids to repeated impacts of hardened high-speed members, typically in preparation for composting.

A joint demonstration project in Madison, Wisconsin, uses a hammer mill to grind municipal refuse into an inoffensive product that can be landfilled with only partial cover and in half the space of unprocessed refuse. The use of refuse fragmentation equipment in the United States is increasing gradually, particularly in conjunction with the sundry recycling schemes. The current trend is toward larger and more powerful machines capable of handling a more heterogeneous mix of refuse.

(2) Sorting

Sorting of packaging waste into its constituent materials, also known as separation or segregation, is essential in recovery operations; but it is very useful in other processing steps, where it permits the optional adjustment of operating conditions to each category of refuse. The sorting task can be aided considerably by fragmenting refuse to enhance the cleanliness of individual particles and by screening to promote dimensional uniformity. Thus, the cost of ancillary processing and handling equipment should be considered in planning a sorting installation.

Sorting relies on differences in the physical characteristics of materials, including size, shape, specific gravity, brittleness, elasticity, color, reflectance, magnetic susceptibility, electric conductivity, absorption of electromagnetic radiation, and radioactivity. Inasmuch as typical refuse materials are not sufficiently clean and unique in any one characteristic, a combination of two or more sensors may be employed.

Sorting techniques may be categorized loosely as:

- Manual
- Dimensional

- Dynamic
- Optical
- Electric and magnetic.

In spite of the rising costs of labor, manual sorting from conveyors is still the most common method employed at nearly all composting plants and some incinerators. Development of mechanical methods has been rather recent and consists largely of adoption of proven techniques from the mineral processing industry.

Sorting of refuse according to particle size is a frequent prerequisite to other sorting or processing operations, where size uniformity is desirable. It can also serve to separate refuse according to differences in brittleness, on the premise that the size of particles produced by the preceding fragmentation step is inversely related to the brittleness of each material. Size separation, perhaps the simplest sorting operation, is accomplished typically by passing refuse over a series of vibrating screens.

Dynamic sorting techniques rely on combinations of characteristics that affect the motion of refuse particles (e.g., size, specific gravity, inertia, shape, and elasticity). The more popular devices are the air classification unit, the vortex classifier, the stoner, the fluidized bed separator, the ballistic separator, the secator, and the inclined conveyor.

The air classification unit consists of a series of zigzag-shaped columns and cyclone separators and relies on differences in specific gravity and aerodynamic characteristics of materials. A stream of air flowing upward through the columns carries the lighter particles to the top, where they are removed by the cyclones, while the heavier particles fall to the bottom. The zigzag configuration promotes entrainment of the refuse particles in the air stream and permits separation of materials with only slight differences in specific gravity. Adjustment of column dimensions and air speed extend the applicability of the unit to a wide range of materials.

Optical sorting techniques have been used successfully in the agricultural, food processing, and mining industries and promise a flexible, efficient operation with solid wastes as well. The Sortex optical separator projects refuse particles through an optical box, where they are viewed by four photocells against a suitably selected background. Any particle that differs in color or shade from the standard background triggers a short blast of air that deflects it into a separate chute.

A sorting system developed by the Bureau of Mines Metallurgy Research Center at College Park, Maryland, separates incinerator residue into clear and colored glass fractions, ferrous and nonferrous metal fractions, and a residue of ash and sand. The equipment consists of a series of vibrating screens, magnetic separators, and an air classifier. Another process, capable of extracting paper, glass, metal, and plastics from municipal refuse at the rate of 60 tons/hr is currently under development by the Franklin Institute of Philadelphia. The system will employ vibrating screens, baffles, paddle wheels, and gravity separators.

Bulk reduction and the associated flow is discussed immediately below, while reclamation and its associated flow is discussed in heading 5.

3. BULK REDUCTION

Reduction of the bulk, or volume, of packaging waste served to decrease the handling, transportation, and disposal costs. Conventional incineration, long the favored method of bulk reduction, is now encountering competition from advanced types of incineration and from high pressure baling.

(1) Baling

Compression of packaging waste is the most direct method of bulk reduction. Its extent is governed not only by the applied pressure, but also by the manner of application, and the composition of waste. In the ideal configuration, all voids are eliminated, and the close contact between waste particles promotes adhesion and physical interlocking to form a cohesive stable structure with a density approaching that of the solid material.

Tests conducted by the American Public Works Association in Chicago and the City of San Diego concluded that:

- Compression ratios as high as 11 to 12 are attainable with municipal waste.
- Optimum compaction of municipal wastes requires pressures in the neighborhood of 2500 psi.
- Incremental compression of distinct portions of the waste produces a less stable structure.
- Optimum moisture content is in the neighborhood of 25 to 30 percent.
- The presence of metal scrap enhances stability of the bale.
- The presence of yard trimmings and large amounts of paper degrades the stability of the bale.

The behavior of various baled wastes in a marine environment remains a major unanswered question.

Low-level compaction of solid wastes has been practiced in the United States for a number of years. Compaction ratios of 2 to 4 are attained in stationary residential and institutional compactors, as well as in packer collection vehicles mentioned in the preceding sections. Similar results are achieved by compacting tractors at a landfill. Small paper balers reach compression ratios as high as 6 to 8. Massive equipment, capable of exerting even higher pressures (in excess of 2000 psi), was restricted, until recently, to the processing of metal scrap and other industrial waste.

Large-scale, high pressure compaction and baling of municipal waste was popularized with the announcement of a process for compressing refuse into sterile bales that could be clad in asphalt or concrete and used as building blocks. Since then, well over 50 U.S. firms have entered the refuse baling field with equipment or management services.

An American industrial firm manufactures a horizontal press with a continuous operation and a capacity of 25 tons/hr. The refuse is shredded, charged into a vertical chute, and dropped into the compression chamber. Successive charges are compressed by repeated strokes of the horizontal ram into 6- to 8-in. contiguous layers. When the desired thickness has been reached, the bale is banded and removed for storage and shipment. Typical bales measure 30 by 40 by 71 in., weigh 3000 to 2500 lb., and have a density of up to 60 lb/cu ft.

A machine presently on the market employs three rams operating consecutively along the three orthogonal directions to compress each successive batch of refuse. The system can compress 60 tons/hr and does not require shredding or banding. The bales weigh 2500 to 3000 lb and have a density of 60 lb/cu ft. Another baling machine has a capacity of 60 tons/hr and compresses refuse into 16-in. contiguous layers. The bale, formed by strapping three layers together, measures 4 by 4 by 4 ft, and weighs between 4000 to 6000 lb.

In the narrow bulk reduction role, high pressure baling offers a number of advantages over conventional incineration:

- It accepts all types of waste, including noncombustibles and plastics.
- It yields greater volume reduction on the basis of all municipal wastes (80 to 90 percent versus 65 to 75 percent).
- Its capital and operating costs are, respectively, 1/10 and between 1/3 and 1/2 of corresponding incineration costs.
- It requires less maintenance and operating skill.
- It generates no significant air or water pollution.
- It produces a residue that is easier to handle, transport, and landfill.
- It affords nearly full future recovery of waste materials.

When incineration is combined with heat or other forms of resource recovery, the choice becomes less clear.

(2) Conventional Incineration

Conventional incineration of packaging and other solid wastes has been gradually replacing open burning as a common approach to bulk reduction. Nevertheless, burning in the open still remains the cheapest, most widely used, as well as least desirable method. The smoke and stench contribute appreciably to the local air pollution problem, and incompletely burned organic waste putrefies and attracts rats and flies.

A modern incinerator consists of a combustion chamber, where the refuse burns on moving grates at 760 to 982° C (1400 to 1800°F), a secondary combustion zone for burning off combustible gases, and flues to convey the exhaust gases to the stack and then to the atmosphere. The flues of modern incinerators are equipped with pollution control devices to minimize the amount of pollutants discharged into the atmosphere. About 10 to 35 percent of the original volume of refuse remains as sterile incombustible residue and fly ash and must be transported to a disposal site.

The major drawbacks of incineration still remain unresolved. These include the high cost of construction, maintenance, and pollution control, frequent downtime to replace refractory lining and grate elements damaged by excessive temperatures and corrosive gases, and incomplete combustion caused by heterogeneity of the waste charge. The principal development efforts designed to correct some of these problems have focused on incineration of bulky waste, suspension of the waste charge, improved emission control, high temperature incineration, and waste heat recovery.

(3) Advanced Incineration

Incineration of bulky solid wastes, such as logs, crates, furniture, mattresses, and large appliances, requires either fragmentation, followed by conventional incineration, or batch incineration in specially designed furnaces. The former method has been stymied by the lack of suitable fragmentizers, capable

of handling the wide variety of sizes and materials encountered. Moreover, this equipment is very noisy and hazardous, and its capital and operating costs are slightly higher than those of a special furnace, equipped with an air pollution control system.

Suspension firing is a method of incineration, where waste is supported in a fluid medium rather than on the conventional metal grate. This innovation has been instrumental in promoting more uniform temperature distribution, better interaction of waste with oxygen, a higher combustion rate, and a greater heat output, and in reducing the operating temperature and the amount of excess air required. Although suspension firing has been used widely in power and heating furnaces, and even for combustion of sewage sludge and certain industrial waste, its application to packaging and other commercial waste requires further demonstrations.

Incinerator emissions control experienced perhaps the most concrete near-term advance in incineration technology because the necessary equipment has been available for some time. The principal air pollutants of incineration are fly ash and carbon monoxide. Until recently, fly ash emission was controlled by such mechanical devices as settling chambers, baffles, or cyclones, and occasionally by wet scrubbers. However, with the advent of stricter air pollution control codes, requiring cleaning efficiencies as high as 95 to 98 percent, this equipment is being replaced by high-energy scrubbers, bag filters, and ultimately electrostatic precipitators. Carbon monoxide and hydrocarbon emissions are being abated by improvements in the combustion process, such as more uniform heating of waste particles and more intimate mixing with oxygen.

(4) Waste Heat Recovery

The recovery of waste heat generated in the incineration of solid wastes, although practiced extensively in Western Europe, has only recently received well-deserved attention in the United States, as part of the overall concern with air pollution control and the impending energy crisis. The two most common designs of waste heat recovery installations involve steam generation by a boiler located immediately after the

conventional refractory furnace, or by water-bearing pipes imbedded in the furnace walls. The steam can then be used for space heating, for driving a steam turbine, including an electric generator, or for other applications. A third concept involves the burning of refuse as fuel in a power plant. A fourth experimental scheme employs a gas turbine that is driven directly by the hot, pressurized combustion gases.

The furnace and boiler combination has the advantages of simpler and cheaper construction but requires the introduction of 150 to 200 percent excess air to prevent damage to the refractory lining. The second design, commonly known as "waterwall furnace," permits the use of only 50 to 100 percent excess air by virtue of more efficient heat transfer, and thus reduces the required capacity of air pollution control equipment. Both systems obviate the need for special cooling of effluent gases to protect this equipment.

A serious problem lies in matching the incinerator's variable heat output to the customer's variable demand. This can be remedied to a large extent by maintaining adequate auxiliary sources of energy, by tying into a large utility network, or even by restricting the use of recovered heat to servicing the incinerator plant and associated facilities. Undoubtedly, more stringent air pollution control regulations, the increasing scarcity of low-sulfur fuels, and the rising heat content of municipal solid wastes will render heat recovery even more attractive in the future.

Heat recovery with the aid of boilers is practiced at U.S. incinerators in Providence, Atlanta, Miami, Boston, Chicago (Southwest), and Merrick, Oceanside, and Oyster Bay, New York. The first operational waterwall incinerator in America was constructed in 1967 at the Norfolk Naval Station at a cost of $2.2 million. The plant generates 50,000 lb/hr of steam to heat shore facilities as well as existing ships. Subsequent installations have been completed at Chicago (Northwest), Montreal, Hamilton, Ontario, and Braintree, Massachusetts.

(5) <u>High-Temperature Incineration</u>

High-temperature incinerators, also known as slagging incinerators, operate at 1500 to 1700°C (2732 to 3092°F),

above the melting point of most common substances; whereas in conventional incinerators temperature must be maintained below 1000^{o}C (1832^{o}F) to prevent damage to refractory lining and grate materials. Their principal advantages are:

- Acceptance of practically all types of municipal waste
- Outstanding bulk reduction of up to 97 percent
- Complete combustion of all combustible materials
- Potential utilization of solid residue
- Generally reduced air pollutant emissions.

The disadvantages include:

- Need for auxiliary fuel and fluxing agent
- More rapid deterioration of refractory material
- Higher emission of NO_x.

High temperature incineration technology has been largely borrowed from the steel industry, and the several existing designs are still in the development or demonstration stages.

4. DISPOSAL

The ultimate disposal of packaging and other solid wastes generally takes place on land, since dumping in waterways has been banned and disposal at sea is restricted. The preferred form of land disposal is sanitary landfill, though other more innovative approaches have been tried as well.

(1) Sanitary Landfill

Sanitary landfill is gradually replacing open dumping as the preferred method of land disposal, and currently accounts for nearly 10 percent of waste disposal. Under this approach, the waste is discharged into a trench, compacted by bulldozers,

and covered with about 1/2 to 2 ft of compacted soil as a sanitary precaution.

The recent proliferation of sanitary landfills has brought an increased convern for the environmental dangers posed by land disposal. These include:

- The generation of carbon dioxide and the more noxious and flammable methane, ammonia, and hydrogen sulfide through aerobic and anaerobic decomposition

- The leaching of these and other contaminants by rainfall into nearby waterways and ground water supplies

- Eventual subsidence of the surface as a consequence of these two factors and mechanical consolidation.

Solutions to gas generation include insertion of vents, construction of gas barriers, and emplacement of impermeable covers. Efforts to prevent leaching contamination have been expanded beyond the customary sloping of the landfill cover to the provision of an impermeable lining for the site. The leachate is collected at a catchment point and purified by conventional wastewater treatment techniques. The extent of mechanical consolidation and landfill subsidence can be minimized by compaction and/or shredding of refuse.

(2) <u>Other Land Disposal Methods</u>

Several other land disposal methods that have yielded promising results include mine filling and topographic alteration.

The idea of using strip mines for waste disposal and subsequent land reclamation was advanced in connection with the rail haul of municipal waste, offered for several years by a number of the nation's railroads. The advantages of utilizing these abandoned mines include the existence of access roads, availability of ample overburden for cover, reclamation of otherwise useless land, and the somewhat whimsical notion of restoring a potential mine for the time when raw mineral resources become depleted. Another interesting possibility is

presented by the blending of waste disposal into the operations of an active mine. The waste would be deposited next to an area about to be stripped and covered with the spoils removed from the ore.

Finally, solid waste disposal presents a rich opportunity for topographic engineering. An MIT study suggested the filling of the extensive rights-of-way of Federal and State highways, railroads, and power lines, listing such benefits as convenient access, improved road safety, and avoidance of jurisdictional disputes. In Wheeling, West Virginia, a gap between two hills is being bridged by deposited refuse in preparation for the construction of a major parkway. Recreational complexes designed around mounds of solid waste are in the planning or construction phase at Virginia Beach, Virginia; Riverview, Michigan; and Brookhaven, New York.

(3) Disposal at Sea

The amount of wastes discharged at sea grew rapidly after World War II, reaching 48.2 million tons (wet tonnage) in 1968, but it is now on the decline as a result of Federal and State legislation.

In theory, the oceans, which cover 71 percent of the earth's surface, offer a nearly unlimited capacity for assimilation of most wastes. This does not work out in practice primarily because of U.S. failure to control, treat, and distribute the wastes properly and because of the concentration of toxic substances in the food chain. Substantial pollution of the ocean is unacceptable, not only because of esthetic reasons but also because of the need to preserve the photoplankton that is largely responsible for generating the world's oxygen supply.

5. RECLAMATION

Reclamation of useful components from the solid waste stream can take the form of conversion, salvage, or secondary utilization. The latter involves the use of an unaltered waste material in a new role and is illustrated by the employment of municipal refuse in altering topographic features for recreational purposes, the incorporation of glass cullet and fly ash in construction materials, or the underwater

emplacement of discarded tires as fish habitats. Salvage entails the removal of a component from the waste stream and physical processing into a form suitable for reuse. The most typical salvageable packaging materials are paper, glass, and metal scrap. Finally, conversion is defined as the chemical or biochemical transformation of a waste material into a useful pyrolysis, hydrogenation, wet oxidation, and hydrolysis; the biochemical processes take in composting, anaerobic digestion, and biological fractionation. Waste heat recovery, a special form of conversion, was reviewed earlier.

(1) Pyrolysis

Pyrolysis, or destructive distillation, is a time-tested process for breaking down organic substances into a carbonaceous char; an oil fraction containing acetic acid, acetone, and methanol; and a gas fraction consisting primarily of carbon monoxide, hydrogen, methane, and carbon dioxide, by heating the materials at 600 to 1000°C (1112 to 1832°F) in the absence of oxygen. These products can then be separated and sold individually or used as fuel.

During the past decade, a number of successful developmental efforts have been undertaken by the Bureau of Mines Energy Research Center in Pittsburgh and other research institutions to adapt pyrolysis to the treatment of packaging and other municipal wastes. In light of the favorable technical and economic outlook indicated by pilot plant results and limited commercial experience, as well as freedom from the major problems plaguing municipal incinerators, a number of commercial enterprises have attempted to market their own pyrolysis systems. Thus far, no major municipal facilities have been built, but several are under serious consideration.

(2) Composting

Composting, or aerobic digestion, is a controlled process, in which aerobic bacteria convert cellulose waste into a relatively inert humus-like material. The procedure generally requires shredding of the waste materials, removal of the 25 percent noncompostable fraction (metals, glass, plastics, and rubber), addition of water or sewage sludge, digestion for 4 to 6 days at

50 to 75°C (122 to 167°F), and curing to reduce the moisture content. The microbiological activity, and consequently the duration of the digestion phase, is a function of the particle size, moisture, oxygen access, temperature, pH, and carbon/nitrogen ratio of the waste material. Bulk reduction is between 30 to 50 percent, and the product is suitable for use as a soil conditioner, as a base for fertilizer, or even in the manufacture of wallboard.

The 20-year history of composting ventures in the United States has been less than an unqualified success principally because of the lack of ready markets for the product, but it also is a result of some technical difficulties. Of the 20-plus composting plants built in this country since 1951, only two or three are still functioning, with varying degrees of success. In Europe, India, and other parts of the world, composting has proved more successful, reflecting a greater demand for natural fertilizers and soil conditioners.

(3) Other Reclamation

A number of other chemical and biochemical conversion processes for cellulosic waste have been investigated in the laboratory and pilot plant. Those showing the most promise thus far are:

- Hydrogenation
- Wet Oxidation
- Hydrolysis
- Anaerobic Digestion
- Biological Fractionation.

Hydrogenation is a chemical process that converts cellulose waste into low-sulfur fuel oil by heating the material under pressure with water and carbon monoxide. Wet oxidation heats the waste material under pressure with water and oxygen to produce carbon monoxide, carbon dioxide, a mixture of organic acids, and a solid fibrous sludge. Hydrolysis converts cellulosic waste into fermentable sugars by heating with an acid.

Then the sugars can be fermented to produce ethyl alcohol, citric acid, animal fodder, and other useful substances.

Anaerobic digestion employs anaerobic bacteria to convert cellulosic waste at an elevated temperature and in the absence of oxygen into methane, carbon dioxide, hydrogen sulfide, and a solid residue. Biological fractionation is a generic term for a number of biochemical processes that employ microorganisms to convert cellulosic waste into glucose and other even more useful products, such as single cell protein.

(4) Salvage

Salvage is defined in this report as the restoring of waste materials to their original utility. It can take the form of direct reuse, recycling, or reprocessing. Direct reuse is best illustrated by returnable containers or pallets; recycling refers to the reuse of process waste at the manufacturing plant; reprocessing involves the cleaning and processing of consumer, or secondary, waste by recycling by the manufacturer.

1. Problems and Opportunities

The major factors affecting widespread salvage of packaging waste are the cost effectiveness of salvaged materials and their public acceptance.

Cost effectiveness of the salvaged materials is frequently unfavorable because of the low cost of virgin packaging materials; the high cost of sorting, cleaning, and reprocessing of salvaged materials; and the relatively high freight rates established by the Interstate Commerce Commission for scrap materials. Packaging manufacturers compound the problem through the use of such complex materials as coated papers and bimetallic cans.

Public acceptance of products made with reclaimed materials has increased greatly with the recent swell of interest in environmental enhancement. However, many procurement regulations still discriminate in favor of virgin materials.

Packaging materials most likely to be reclaimed include paper, glass, and aluminum.

2. Paper and Textiles

Paper products constitute by far the largest component (45 to 50 percent) of municipal waste. Of the 53.5 million tons of paper products manufactured in the U.S. in 1969, 10.4 million tons, or 19.5 percent, were accounted for by paper scrap, mostly from paper jobbers, publishers, container fabricators, and similar commercial sources. In addition, most paper mills recycle their own waste, or "broke," so that the concept of paper recycling is subject to considerable interpretation. Over 70 percent of the scrap went into the production of paperboard, over 15 percent went into building products (including wall board, roofing, and insulation), and the remainder was fairly evenly divided among newsprint, coated printing paper, uncoated printing paper, and writing paper.

The National Academy of Engineering has estimated that U.S. consumption of paper products will double by 1985, requiring a 35 percent reclamation rate in order to balance the nation's wood and fiber resources. Nevertheless, the current rate is part of a trend that began at 35 percent during World War II and has been going downhill ever since.

Some 17 percent of the 1.2 million tons of textile waste generated annually in the United States is reclaimed, mostly as wiping rags for industrial use. Cotton waste is used in the manufacture of fine writing and roofing papers. Reclamation of textile scrap from residential waste is practically nonexistent.

3. Glass and Plastics

The glass content of packaging and other municipal waste has grown in recent years as a result of the increasing popularity of nonreturnable containers, whereas collections at reclamation centers account for only 2 to 3 percent

of the annual production. At the same time, the demand for glass scrap, or "cullet," in the manufacture of new containers has been reduced by the increased cost of processing and the advent of new and more efficient glassmaking equipment, which no longer requires the use of cullet. The clean, uniform, and readily available trimmings from sheet and plate glass fabrication are more than sufficient to meet the demand for glass powder in the manufacture of reflective paints, abrasives, refractory materials, and similar products.

More efficient sorting and cleaning techniques and new applications for glass scrap are being sought by the Bureau of Mines and the Glass Container Manufacturers' Institute. Numerous attempts at incorporation of cullet in road pavement and construction materials, including bricks, facing panels, and tiles, have yielded very encouraging results. Production of glass fiber is more problematic because the quality and composition of the melt prior to fiberizing must be controlled very closely.

The growing use of plastics in packaging materials presents a troublesome disposal problem. In landfills, the unbreakable plastic containers occupy a disproportionate amount of space. During incineration, most plastics produce heat at a rate three times that of other refuse materials; thermoplastic materials tend to melt and clog incinerator grates; plastic film flies in the air stream and interferes with normal operations; and polyvinyl chloride releases hydrogen chloride gas that can corrode metal parts, including boiler and air pollution control equipment.

A number of institutions and firms have developed plastic materials that degrade upon exposure to solar ultraviolet radiation by incorporating photosensitive groups in the polymer chain.

Reclamation of plastic waste is minimal and consists almost entirely of reprocessing industrial thermoplastic waste including polyethylene, polyvinyl chloride, and polystyrene. At present there are no commercial techniques for reclaiming mixed plastic waste from the municipal solid waste stream.

4. <u>Systems</u>

Several major solid waste salvage systems have been proposed during the past few years. They use different combinations of fragmenting, sorting, conversion, and reclamation techniques and are currently in various stages of design, development, construction, and actual operation.

One of the earliest has been an effort by the Bureau of Mines Metallurgy Research Center at College Park, Maryland, to separate and extract useful substances from incineration residue. The 300 municipal incinerators operating in the United States process in the neighborhood of 35 million tons of refuse per year, and generate some 5 million tons of residue. Each of these can yield on the average 1000 lb of glass, 700 lb of iron, 40 lb of nonferrous metals, and an ash that can serve as fill.

One research firm has looked into the reclamation of residue from high-temperature incineration. The molten residue is separated into a metallic and a ceramic fraction on standing at temperatures above 1500°C (2732°F). The ceramic fraction can be processed into glass wool, sewer pipe, tiles, and structural blocks, whereas the metallic fraction can serve for the manufacture of assorted metal objects, where material characteristics are not of critical importance.

One of the most complete solid waste processing systems went into operation 2 years ago as a joint commercial/governmental venture in the city of Franklin, Ohio. The system accepts mixed municipal waste, with the exception of bulky items, and yields paper fiber, ferrous and nonferrous metals, a mixed glass fraction, and a combustible fraction, which provides waste heat recovery.

Raw waste is fed into a wet pulping machine, where pulpable and friable components are fragmentized and converted into a 3-1/2 percent water slurry. Other components, primarily metal objects, are ejected, washed, and separated for reclamation. Heavy particles (primarily glass) are removed from the slurry by centrifugal action.

A series of steps follow, designed ultimately to reclaim paper fibers. The residual slurry is dewatered and burned in a fluidized bed furnace, and the ash residue is landfilled. An auxiliary system to sort and reclaim the mixed glass fraction is under development.

A 500-ton/day facility using composting, pyrolysis, and reclamation techniques has been designed for New-castle County, Delaware. Residential refuse will be mixed with sewage sludge and composted in a Fairfield digestion unit. Noncompostable organic components, including plastics, rubber, and rags, will be pyrolyzed. Inorganic residues, such as nonferrous metals, glass, grit, and sand, will be sorted by screens and gravity tables and reclaimed. Industrial and commercial wastes will be handled in similar fashion, following a preliminary reclamation stage.

APPENDIX B

SPECIFIC CRITERIA DEVELOPMENT AND METHODOLOGY

This appendix is a comprehensive presentation of:

- The development of the criteria for both solid and chemical packaging wastes

- The methodology employed to determine the total disposal rating for both solid and chemical packaging wastes

A summary of this appendix may be found in Chapter II, Section 4, pages II-39 through II-47.

1. SOLID WASTE CRITERIA DEVELOPMENT

The disposability of solid packaging materials was evaluated by examining each of the following possible processes:

- Reuse
- Recycle
- Pyrolysis
- Composting
- Baling
- Incineration
- Sanitary landfill
- Sea disposal.

The applicability of each of these processes was analyzed to establish an operational rating and an environmental rating for each material.

(1) Operational Rating System

In designing the operational rating system, it was necessary first to determine mutually exclusive material characteristics that have a direct bearing upon the operation of each process. For example, in the process of incineration, material characteristics that bear upon the process are: (1) fragmentability, (2) separability, (3) combustibility, and (4) potential damage to the equipment.

Secondly, for each process, it was necessary to enumerate the relative importance of each characteristic; that is, by comparing all the material characteristics related to each process, those characteristics that are more, equal, or less important than others were determined. Once the qualitative decisions were made, they were quantified as portions of unity (1.0). Using the incineration example, it was determined that combustibility was the most important and therefore a relative importance of 0.5 was assigned. Fragmentability and potential damage to the equipment were determined to be equally weighted and were each assigned a relative importance of 0.2. Lastly, separability had the least effect on the operation and was assigned at relative importance of 0.1. This rationale is depicted in Table B-1.

(2) Environmental Rating System

The environmental rating system was devised to measure the environmental impact of processing the solid waste material through each disposal alternative. Using this system, the major environmental disruptions were analyzed, that is, the potentials for air pollution, water pollution, land pollution, and resource depletion. As in the operational rating system, relative importance factors based upon portions of unity (1.0) were assigned to each environmental impact. But, unlike the operational rating system, the relative importance factors were equally weighted for each disposal alternative. The rationale for this weighting is that it would not be adequate to just measure what is environmentally good or bad, for this would indicate a qualitative or quantitative bias. Rather, one must take into account the total environmental impact of each process. The exceptions to this rationale are in (1) direct reuse and (2) recycle. In the case of direct reuse, the material would

TABLE B-1

RELATIVE IMPORTANCE OF OPERATIONAL DISPOSABILITY CHARACTERISTICS

Characteristics	Direct Reuse	Recycle	Pyrolysis	Compost	Baling	Incineration	Sanitary Landfill	Sea Disposal
Fragmentability	- -	- -	0.2	0.2	- -	0.2	0.1	- -
Separability	0.5	0.4	0.2	0.2	- -	0.1	- -	- -
Material Density	- -	- -	- -	- -	- -	- -	0.2	0.2
Compactibility	- -	- -	- -	- -	0.4	- -	0.4	0.3
Baleability	- -	- -	- -	- -	0.6	- -	- -	- -
Combustibility	- -	- -	- -	- -	- -	0.5	- -	- -
Chemical and /or Biological Degradability	- -	- -	0.4	0.4	- -	- -	0.3	0.3
Market for Commodity	0.5	- -	- -	- -	- -	- -	- -	- -
Potential Damage to Equipment	- -	- -	- -	- -	- -	0.2	- -	- -
Regulatory or Technical Operating Restrictions	- -	0.6	0.2	0.2	- -	- -	- -	0.2
Total	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

be precluded from entering the solid waste stream and, therefore, at the present time would not be disposed of. In the case of recycle, the material most probably would be transported to the issuing industry or secondary industry for recycling. The environmental impact of a disposal process rather than an industry was to be determined and, therefore, recycling was excluded from the above rationale. Yet, direct reuse and recycling were environmentally analyzed, but only in terms of resource depletion potential. The environmental rating system is disclosed in Table B-2.

(3) Operational and Environmental Rating Definitions

To utilize the aforementioned rating systems, rating and rating code scales ranging in numerical value from 0 to 10 were employed as follows:

Rating	Rating Code
Excellent	9-10
Good	7-8
Fair	5-6
Poor	3-4
Unsatisfactory	0-2

Moreover, for each characteristic and environmental impact, definitions corresponding to each rating and rating code were developed to apply the rating system consistently. Basically, these definitions were used as a guide for classifying the solid waste packaging material on the basis of either a numerically measurable or clearly defined characteristic.

Tables B-3 to B-14 enumerate the rating, rating code, and rating definitions for both operational and environmental considerations for each process.

For example, referring to Table B-5 under the operational rating definition of fragmentability, excelsior, in the form of shreds, would be considered "excellent" because it needs no process for reduction; veneer crate would be considered "good" because it would need only very light equipment for

TABLE B-2

RELATIVE IMPORTANCE OF ENVIRONMENTAL IMPACT

Environmental Impact	Direct Reuse	Recycle	Pyrolysis	Compost	Baling	Incineration	Sanitary Landfill	Sea Disposal
Air Pollution Potential	- -	- -	0.2	0.2	0.2	0.2	0.2	0.2
Water Pollution Potential	- -	- -	0.2	0.2	0.2	0.2	0.2	0.2
Land Pollution Potential	- -	- -	0.2	0.2	0.2	0.2	0.2	0.2
Resource Depletion Potential	1.0	1.0	0.4	0.4	0.4	0.4	0.4	0.4
Total	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

TABLE B-3

OPERATIONAL RATING DEFINITIONS OF DIRECT REUSE

Rating	Rating Code	Separability	Market for Commodity*
Excellent	9-10	Sorting is possible by mechanical means	Market for the commodity exists and may be supplied with little or no re-processing of the commodity
Good	7-8	Mechanical sorting is possible but must be supplemented by manual sorting	Market exists for the commodity, but seller must sort commodity into grades or types before it is salable
Fair	5-6	Mechanical sorting is impracticable; can be easily sorted by manual means	Market exists, but seller must process the commodity by cleaning, renovating, etc.
Poor	3-4	Mechanical sorting is impracticable; cannot be easily sorted by manual means	Market does not exist for the commodity but may be a possibility via extensive processing
Unsatisfactory	0-2	Mechanical and manual sorting is impracticable	Market does not exist for the commodity and is unlikely to develop

* Distribution of commodity into marketplace would not alter local, regional, or national markets.

TABLE B-7

OPERATIONAL RATING DEFINITIONS OF RECYCLE

Rating	Rating Code	Separability	Technical Operating Restrictions
Excellent	9-10	Sorting is possible by mechanical means	The waste material can be used directly in place of virgin material or feedstock in existing production process; the new product is of high quality
Good	7-8	Mechanical sorting is possible but must be supplemented by manual sorting	The waste material can be used with preprocessing along with virgin material or feedstock in existing production process; the new product is of high quality
Fair	5-6	Mechanical sorting is impracticable; can be easily sorted by manual means	The waste material can be used with preprocessing along with virgin material or feedstock in existing production process; the new product is of low quality
Poor	3-4	Mechanical sorting is impracticable; cannot be easily sorted by manual means	The waste material can be used with preprocessing along with virgin material or feedstock in a process that is not currently used in the industry
Unsatisfactory	0-2	Mechanical and manual sorting is impracticable	The waste material cannot be used as any kind of feedstock

TABLE B-5

OPERATIONAL RATING DEFINITIONS OF PYROLYSIS

Rating	Rating Code	Fragmentability	Separability	Chemical Degradability	Technical Operating Restrictions
Excellent	9-10	Material needs no process for reduction	Sorting is possible by mechanical means	Material will easily decompose by chemical action	Process is widely used for solid waste application
Good	7-8	Material needs very light equipment or manual shredding for reduction	Mechanical sorting is possible but must be supplemented by manual sorting	Material will slowly decompose by chemical action	Process requires modification of off-the-shelf equipment to be used for solid waste application
Fair	5-6	Material must be reduced by light equipment	Mechanical sorting is impracticable;can be easily sorted by manual means	Material is partially degradable by chemical action	Process is a pilot scale model for general solid waste application
Poor	3-4	Material requires heavy equipment for reduction	Mechanical sorting is impracticable;cannot be easily sorted by manual means	Material is highly resistant to chemical degradability	Process is a pilot scale model for specialized solid waste application
Unsatisfactory	0-2	Material requires specialized equipment for reduction	Mechanical and manual sorting is impracticable	Material is virtually indestructable; will not degrade	Process is a laboratory scale model

TABLE B-6

OPERATIONAL RATING DEFINITIONS OF COMPOST

Rating	Rating Code	Fragmentability	Separability	Biological Degradability	Technical Operating Restrictions
Excellent	9-10	Needs no process for material reduction	Sorting is possible by mechanical means	Material will degrade easily by biological action	Process is widely used for solid waste application
Good	7- 8	Needs very light equipment or manual shredding for material reduction	Mechenical sorting is possible but must be supplemented by hand sorting	Material will slowly decompose by biological action	Process requirea modification to off-the-shelf equipment to be used for solid waste application
Fair	5- 6	Material must be reduced by light equipment	Mechanical sorting is impracticable;can be easily sorted by manual means	Material will partially decompose by the addition of chemicals	Process is a pilot scale model for general solid waste application
Poor	3- 4	Requires heavy equipment for material reduction	Mechanical sorting is impracticable; cannot be easily sorted by manual means	Material will not decompose but may be left in the compost	Process is a pilot scale model for specialized solid waste application
Unsatisfactory	0- 2	Requires specialized equipment for material reduction	Mechanical and manual sorting is impracticable	Material will not degrade and is an undesirable component of compost	Process is a laboratory scale model

TABLE B-7

OPERATIONAL RATING DEFINITIONS OF BALING

Rating	Rating Code	Compactibility	Baleability
Excellent	9-10	10 and above	Deforms easily under pressure and retains compacted form after pressure is released
Good	7-8	8-10	Deforms with some difficulty and retains compacted form after pressure is released
Fair	5-6	5-7	Deforms easily but springs back when pressure is released
Poor	3-4	3-4	Deforms with some difficulty but springs back when pressure is released
Unsatisfactory	0-2	1-2	Cannot effectively be compacted

TABLE B-8

OPERATIONAL RATING DEFINITIONS OF INCINERATION

Rating	Rating Code	Fragmentability	Separability	Burning Rate (Combustibility)	Potential Damage to Equipment From Materials
Excellent	9-10	Material needs no process for reduction	Sorting is possible by mechanical means	Very high	None
Good	7- 8	Material needs very light equipment or manual shredding for reduction	Mechanical sorting is possible but must be supplemented by manual sorting	High	None when incinerator is operated properly
Fair	5- 6	Material may be reduced by light equipment	Mechanical sorting is impracticable; can be easily sorted by manual means	Low	Can sometimes disturb system operations
Poor	3- 4	Material requires heavy equipment for reduction	Mechanical sorting is impracticable; cannot be easily sorted by manual means	Self-extinguishing	Seriously disturbs systems operations
Unsatisfactory	0- 2	Material requires specialized equipment for reduction	Mechanical and manual sorting is impracticable	Nil	Damage is catastrophic and causes plant shutdown.

TABLE B-9

OPERATIONAL RATING DEFINITIONS OF SANITARY LANDFILL

Rating	Rating Code	Fragmentability	Material Density (lb/ft^3)	Compactibility	Biological Degradability
Excellent	9-10	Materials need no process for reduction	100 or above	Deforms or crushes easily under pressure and retains compacted form after pressure is released	Material will easily disintegrate in soil by bacterial action
Good	7- 8	Material needs very light equipment or manual shredding for reduction	70 to 100	Deforms easily but springs back when pressure is released	Material will slowly degrade by bacterial action
Fair	5- 6	Material may be reduced by light equipment	50 to 70	Deforms with difficulty	Material will decompose by chemical action
Poor	3- 4	Material requires heavy equipment for reduction	31 to 50	Deforms but requires special handling	Material is highly resistant to both bacterial and chemical action in the soil
Unsatisfactory	0- 2	Material requires specialized equipment for reduction	30 or less	Cannot effectively be compacted	Material is virtually indestructible; will not degrade

TABLE B-10

OPERATIONAL RATING DEFINITIONS OF SEA DISPOSAL

Rating	Rating Code	Material Density (lb/ft^3)	Compactibility	Biological Degradability	Regulatory Operational Restrictions
Excellent	9-10	100 and above	Deforms or crushes easily under pressure and retains compacted form after pressure is released	Material will easily degrade and disintegrate by bacterial action	There are no local, regional, and/or national regulatory agencies prohibiting the use of the process
Good	7- 8	70 to 100	Deforms easily but springs back when pressure is released	Material will slowly degrade by bacterial action	
Fair	5- 6	50 to 70	Deforms with difficulty	Material will decompose by chemical action	
Poor	3- 4	30 to 50	Deforms but requires special handling	Material is highly resistant to both bacterial and chemical action	
Unsatisfactory	0- 2	30 or less	Cannot effectively be compacted	Material is virtually indestructible; will not degrade	Local, regional, and/or national regulatory agencies prohibit the use of the process

TABLE B-11

ENVIRONMENTAL RATING DEFINITIONS OF AIR POLLUTION POTENTIAL

Rating	Rating Code	Harmful Gases	Particulate Emissions	Offensive Odors
Excellent	9-10	No harmful constituents	No particulate emissions	No offensive odors
Good	7- 8	Prevailing emissions well below applicable standards	Prevailing particulate emissions well below applicable standards	A miniscule amount of offensive odors
Fair	5- 6	Prevailing emissions below applicable standards	Prevailing particulate emissions within applicable standards	An amount of offensive odors such that aesthatic enjoyment is dampened
Poor	3- 4	Prevailing emissions just above applicable standards	Prevailing particulate emissions just above applicable standards	An amount of offensive odors such that aesthetic enjoyment is hampered
Unsatis-factory	0- 2	Prevailing emissions well in excess of applicable standards	Prevailing particulate emissions well in excess of applicable standards	An amount of offensive odors such that aesthetic enjoyment is totally deprived

TABLE B-12

ENVIRONMENTAL RATING DEFINITIONS OF WATER POLLUTION POTENTIAL

Rating	Rating Code	Toxicity	BOD/COD	Thermal and/or Aesthetics
		The material or the material's by-product(s) is (are):	The material or the material's by-product's(s') biological oxygen demand is:	The process causes:
Excellent	9-10	Insoluble in water and contain (s) no toxic constituents	Nil	No thermal or aesthetics pollution
Good	7-8	Insoluble in water and contain (s) an amount of toxic constituents well below applicable standards	Minuscule	Acceptable thermal pollution and/or no aesthetic pollution
Fair	5-6	Insoluble in water and contain(s) an amount of toxic constituents within applicable standards	Low	Acceptable thermal and/or aesthetic pollution
Poor	3-4	Soluble in water and contain (s) an amount of toxic constituents just above applicable standards	Average	Moderately nonacceptable thermat and/or aesthetic pollution
Unsatisfactory	0-2	Soluble in water and contain (s) an amount of toxic constituents well in excess of applicable standards.	High	Nonacceptable thermal and/or aesthetic pollution

TABLE B-13

ENVIRONMENTAL RATING DEFINITIONS
OF LAND POLLUTION POTENTIAL

Rating	Rating Code	Aesthetics
Excellent	9-10	Aesthetic enjoyment is heightened
Good	7- 8	Aesthetic enjoyment remains the same
Fair	5- 6	Aesthetic enjoyment is partially dampened
Poor	3- 4	Aesthetic enjoyment is hampered
Unsatisfactory	0- 2	Aesthetic enjoyment is totally deprived

TABLE B-14

ENVIRONMENTAL RATING DEFINITIONS OF RESOURCE DEPLETION POTENTIAL

Rating	Rating Code	Scarcity	Depletion/Recovery
Excellent	9-10	There is an abundant supply of the material and its substitutes	The material can be reintroduced as a commodity without any change
Good	7-8	There is an adequate supply of the material and its substitutes	The material is transformed into new products in such a manner that the original products may lose their identity
Fair	5-6	There is a diminishing or limited supply of the material but an adequate supply of its substitutes	Basic materials are reclaimed or retained
Poor	3-4	There is a diminishing or limited supply of the material and its substitutes	Basic materials are destroyed with recovery of waste heat
Unsatisfactory	0-2	There is a diminishing or limited supply of the material and it has no substitutes	Basic material is destroyed

reduction; a wirebound wood crate would be "unsatisfactory" because, owing to the mechanical difficulty encountered by the presence of the steel wire, the crate would require specialized equipment for reduction.

2. SOLID WASTE METHODOLOGY

In this analysis, six separate material categories consisting of 87 separate material subcategories were rated: 18 papers, eight textiles, six woods, four glass, nine metals, and 42 plastics. These were rated in 46 areas; namely, three for reuse, three for recycle, and eight each for pyrolysis, composting, incineration, sanitary landfill, and sea disposal. Altogether, 3256 separate rating judgments were made and 6512 numbers calculated in order to determine the relative disposability ranking for the 87 solid military packaging materials. A corrugated fiberboard box will be used to illustrate the numerical procedure.

(1) Step 1: Rating

The fiberboard box was first rated in accordance with the criteria developed in the rating definitions for the operational characteristics and environmental impacts (Tables B-3 to B-14). These values are shown in Table B-15, the Numerical Process Evaluation Matrix, under the headings of operational rating and environmental rating.

(2) Step 2: Relative Rating

Using the aforementioned operational and environmental values and the relative importance of each characteristic and impact, a relative rating was calculated. This rating is the product of the relative importance multiplied by the rating code value.

For example, in direct reuse, the corrugated fiberboard box is rated 7 for separability, 10 for market for the commodity, and 10 for the resource depletion potential. Weighting these by the relative importance factors assigned to each of these process

TABLE B-15

NUMERICAL PROCESS EVALUATION MATRIX FOR CORRUGATED CONTAINER MATERIAL NUMBER 32

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environ-mental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0. [illegible]	7		3.5	8.5	9.25
	Market for Commodity	0.5	10		5.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	7		2.8	7.0	8.00
	Technical Operating Restrictions	0.6	7		4.2		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	7		1.4	7.8	7.80
	Separability	0.2	7		1.4		
	Chemical Degradability	0.4	10		4.0		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0. [illegible]		8	2.4		
Composting	Fragmentability	0.2	7		1:4	8.8	7.20
	Separability	0.2	7		1.4		
	Biological Degradability	0.4	8		3.2		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Baling	Compactibility	0.4	10		4.0	9.4	8.60
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0. [illegible]		6	2.4		
Incineration	Fragmentability	0.2	7		1.4	9.1	7.75
	Separability	0.1	7		0.7		
	Combustibility	0.5	10		5.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	8.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	7		0.7	6.9	6.95
	Material Density	0.2	1		0.2		
	Compactibility	0.4	9		3.6		
	Biological Degradability	0.3	8		2.4		
	Air Pollution Potential	0.2		10	2.0	7.0	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	1		0.2	5.0	4.60
	Compactibility	0.3	9		2.7		
	Biological Degradability	0.3	7		2.1		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

subcategories yields the following:

Relative Importance	x	Operational Rating	=	Relative Rating
.5	x	7	=	3.5
.5	x	10	=	5.0

Relative Importance	x	Environmental Rating Value	=	Relative Rating
1.0	x	10	=	10.0

where the 3.5 and the 5.0 are operational rating considerations and the 10.0 is the environmental impact.

(3) Step 3: Subtotal

All the relative rating values particular to the operational and environmental considerations are added. The sum of all the respective relative rating is termed the subtotal. In this instance, the operational subtotal is 8.5 and the environmental subtotal is 10.0.

(4) Step 4: Total Disposal Rating

The total disposal rating, for the environmental and operational process rating, is expressed by the mathematical equation:

$$(C_1 \times OST) + (C_2 \times EST) = TDR$$

where: C_1 and C_2 are constants

$C_1 + C_2 = 1.0$

OST = Operational Subtotal

EST = Environmental Subtotal

TDR = Total Disposal Rating.

For the purpose of this analysis, C_1 and C_2 were chosen to be equally weighted or equally evaluated at 0.5.

Therefore, the total disposal rating is:

$$(.5 \times 8.5) + (.5 \times 10.0) = 9.25$$

The total disposal rating as noted on the Summary Fact Sheet has been rounded to the nearest tenth. It is instructive to note that C_1 and C_2, which are again relative importance weights, can be modified in order to evaluate the material being processed under current criteria.

(5) Step 5: Disposal Ranking

The disposal ranking is the assignment of sequential numbers starting with the highest disposal rating and ending with the lowest disposal rating. In this illustration, the following ranking occurs:

Disposal Method	Total Disposal Rating	Disposal Ranking
Reuse	9.25	1
Recycle	8.00	3
Pyrolysis	7.80	4
Composting	7.20	5
Baling	8.60	2
Incineration	7.75	4
Sanitary Landfill	6.95	6
Sea Disposal	4.60	7

This ranking shows the facility officer the order in which disposal alternatives should be utilized. The method of analysis determines the best possible disposal process to be used subject to the constraint of the minimization of environmental pollution and the maximization of process utility.

3. CHEMICAL (LIQUID) WASTE CRITERIA DEVELOPMENT

The disposability of chemical packaging materials was evaluated by examining the following characteristics:

- Ability to recover and reuse all or portions of the liquid waste
- Suitability of the waste material or recovery residue for ultimate disposal by:
  - Sanitary landfill
  - Incineration
  - Sea disposal
  - Microbial treatment (sanitary sewage treatment).

Pyrolysis is considered as a method of recovery of portions of the liquid waste which have some value rather than as a method of ultimate disposal. As in pyrolysis of solid materials, the gases and liquids given off by pyrolysis of certain liquid materials contain value as a fuel. However, pyrolysis of the materials such as chlorinated hydrocarbons or petroleum derivatives, which were surveyed in this study, would yield only broken fractions of unknown content and questionable value; whereas the liquid itself, prior to pyrolysis, may have a greater value and be easier to recover through other means such as distillation. Consequently, pyrolysis has not been extensively investigated as a means of liquid waste disposal.

Each of the process alternatives, such as recovery and reuse or incineration, exhibit similar operational and environmental characteristics. For example, the processing equipment may be integral to the equipment in which the liquid is used, such as a small distillation unit used in dry cleaning machines to purify the dry cleaning fluid, or the processing equipment may be suitable only for large-scale applications such as large distillation columns used to fractionalize liquid wastes. The operational characteristics that were considered were:

- Recovery
- Processing
- Safety

- Residue
- Reusability
- Degradability
- Combustibility.

The environmental impact of recovery or disposal affects the air, water, and land. An additional overall factor that affects the environment is the depletion of resources. Since many of the chemical packaging and preservative materials used by the U.S. Army are based on petroleum derivatives and limited amounts or shortages of petroleum products do exist, resource depletion is considered an important criterion. As a result, the environmental criteria evaluated in this study include:

- Air pollution potential
- Water pollution potential
- Land pollution potential
- Resource depletion potential.

Environmental criteria for recovery and reuse have been included in the chemical waste section of this report since both the recovery process and the disposal of the residue may affect the environment.

As in the environmental analysis of the solid waste materials, the relative importance factors were equally weighted for each disposal alternative. The rationale for this weighting is the same; namely, one cannot just measure what is environmentally good or bad for this would indicate a qualitative or quantitative bias. Rather, one must take into account, the total environmental impact of each process. The weighted values are normalized as fractions of unity (1.0) to enable comparison of the various processes. The relative importance of values for operational and environmental criteria for each process are shown in Tables B-16 and B-17 respectively.

The numerical rating system used in the chemical waste analysis is the same as that used for solid wastes. The rating code is as follows:

Rating	Rating Code
Excellent	9-10
Good	7-8

TABLE B-16

RELATIVE IMPORTANCE OF
OPERATIONAL DISPOSABILITY CHARACTERISTICS

Characteristics	Process				
	Recovery and Reuse	Sanitary Landfill	Incineration	Sea Disposal	Microbial Treatment
Operational					
Recovery	0.4	--	--	--	--
Processing	--	0.3	0.3	0.3	0.1
Safety	0.1	--	0.1	--	--
Residue	0.1	--	0.1	0.3	0.2
Reusability	0.4	--	--	--	--
Degradability	--	0.7	--	0.4	0.7
Combustibility	--	--	0.5	--	--
Total	1.0	1.0	1.0	1.0	1.0

TABLE B-17

RELATIVE IMPORTANCE OF ENVIRONMENTAL IMPACT

Impacts	Process				
	Recovery and Reuse*	Sanitary Landfill	Incineration	Sea Disposal	Microbial Treatment
Air Pollution Potential	0.2	0.2	0.2	0.2	0.2
Water Pollution Potential	0.2	0.2	0.2	0.2	0.2
Land Pollution Potential	0.2	0.2	0.2	0.2	0.2
Resource Depletion Potential	0.4	0.4	0.4	0.4	0.4
Total	1.0	1.0	1.0	1.0	1.0

* Includes residue disposal.

Rating	Rating Code
Fair	5-6
Poor	3-4
Unsatisfactory	0-2

As in the solid waste criteria development, definitions were used as a guide for classifying the liquid waste on a quantified basis. Tables B-18 to B-26 contain the operational and environmental rating definitions of each characteristic for each process.

4. CHEMICAL (LIQUID) WASTE METHODOLOGY

In this analysis 17 chemical packaging materials were rated, including chlorinated hydrocarbons, petroleum distillates, detergents, cleaning compounds, greases, and oils. These liquid materials were rated according to criteria in 36 areas, including eight for recovery and reuse, six for sanitary landfill, eight for incineration, seven for sea disposal, and seven for microbial treatment. Altogether 459 separate rating judgments were made and 867 numbers calculated to determine the relative disposability ranking for the 17 chemical packaging materials. A liquid waste containing tetrachloroethylene, which is used as a dry cleaning solvent, is used in the following paragraphs to illustrate the numerical procedure.

(1) Step 1: Rating

The liquid waste containing tetrachloroethylene was first rated in accordance with the criteria developed in the rating definitions for the operational characteristics and environmental impacts. (Tables B-18 to B-26). These values are shown in Table B-27, the Numerical Process Evaluation Matrix, under the headings of operational and environmental rating.

(2) Step 2: Relative Rating

Using the values developed in Step 1, the relative rating is calculated. The relative rating is the product of the operational rating or environmental impact rating multiplied by the relative importance.

TABLE B-18

OPERATIONAL RATING DEFINITIONS OF RECOVERY AND REUSE

Rating	Rating Code	Recovery	Safety	Residue	Reusability
Excellent	9-10	Portions of the liquid waste may be recycled; recovery equipment is integral to process	Normal fluid handling procedures	0-10%	Portions or all of the waste may be reused in the same process; integritity of product is not destroyed
Good	7-8	Portions of the liquid waste may be recycled, separate recovery equipment	Some special precautions	11-30%	Portions or all of the waste may be used in another process; integrity of product is not destroyed
Fair	5-6	Value may be recovered from the waste stream in separate equipment	Extensive precautions	31-50%	Portions or all of the waste may be used in another process but use modifies integrity of product; reprocessing is required for reuse
Poor	3-4	Value may be recovered from the waste stream in separate equipment; re-processing is required	Specialized equipment required	51-70%	Portions or all of the waste may be used but integrity of product is destroyed
Unsatis-factory	0-2	Practically not possible to reclaim portions or all of waste	Extremely unsafe (may explode, release highly toxic substances, etc.); recovery not recommended	Greater than 70%	The waste cannot be reused even if processed and should be disposed

TABLE B-19

OPERATIONAL RATING DEFINITIONS OF SANITARY LANDFILL

Rating	Rating Code	Processing	Degradability
Excellent	9-10	Material requires no processing for sanitary landfill disposal	Material will easily degrade by bacterial action
Good	7-8	Material requires minor or occasional processing (by light equipment) for sanitary landfill disposal	Material will slowly degrade by bacterial action
Fair	5-6	Material requires constant processing for sanitary landfill disposal	Material will decompose by chemical action
Poor	3-4	Material requires heavy or a variety of equipment for sanitary landfill disposal	Material is resistant to bacterial and chemical action
Unsatis-factory	0-2	Material requires specialized equip-ment for sanitary landfill disposal	Material is virtually indestructible; will not degrade

TABLE B-20

OPERATIONAL RATING DEFINITIONS OF INCINERATION

Rating	Rating Code	Processing	Combustibility	Safety	Residue
Excellent	9-10	Material requires no processing for incineration	Very high	Normal fluid handling procedures	0-10%
Good	7-8	Material requires minor or occasional processing by light equipment for incineration	High	Some special precautions	11-30%
Fair	5-6	Material requires constant processing for incineration.	Low	Extensive precautions	31-50%
Poor	3-4	Material requires heavy or a variety of equipment for incineration	Self-extinguishing	Specialized equipment required	51-70%
Unsatisfactory	0-2	Material requires specialized equipment for incineration	Inflammable	Extremely unsafe; may explode; incineration not recommended	Greater than 70%

TABLE B-21

OPERATIONAL RATING DEFINITIONS OF SEA DISPOSAL

Rating	Rating Code	Processing	Degradability	Residue
Excellent	9-10	Material requires no processing for sea disposal	Material will easily degrade in water by bacterial action	0-10%
Good	7-8	Material requires minor or occasional processing by light equipment for sea disposal	Material will slowly degrade in water by bacterial action	11-30%
Fair	5-6	Material requires constant processing for sea disposal	Material will decompose by chemical action	31-50%
Poor	3-4	Material requires heavy or a variety of equipment for sea disposal	Material is resistant to bacterial and chemical action	51-70%
Unsatisfactory	0-2	Material requires specialized equipment for sea disposal	Material is virtually indestructible; will not degrade	Greater than 70%

TABLE B-22

OPERATIONAL RATING DEFINITIONS OF MICROBIAL TREATMENT

Rating	Rating Code	Processing	Degradability	Residue
Excellent	9-10	Material requires no processing for microbial treatment and disposal	Material will easily degrade by bacterial action	0-10%
Good	7-8	Material requires minor or occasional processing by light equipment for microbial treatment and disposal	Material will slowly degrade by bacterial action	11-30%
Fair	5-6	Material requires constant processing for microbial treatment and disposal	Material will decompose by chemical action	31-50%
Poor	3-4	Material requires heavy or a variety of equipment for microbial treatment and disposal	Material is resistant to bacterial and chemical action	51-70%
Unsatisfactory	0-2	Material requires specialized equipment for bacterialogical treatment and disposal	Material is virtually indestructible; will not degrade	Greater than 70%

TABLE B-23

ENVIRONMENTAL RATING DEFINITIONS OF AIR POLLUTION POTENTIAL

Rating	Rating Code	Harmful Gases	Particulate Emissions	Offensive Odors
Excellent	9-10	No harmful constituents.	No particulate emissions	No offensive odors
Good	7-8	Prevailing emissions well below applicable standards	Prevailing particulate emmissions well below applicable standards	A minuscule amount of offensive odors
Fair	5-6	Prevailing emissions below applicable atandards	Prevailing particulate emissions within applicable standards	An amount of offensive odors such that aesthetic enjoyment is dampened
Poor	3-4	Prevailing emissions above applicable standards	Prevailing particulate emissions just above applicable standards	An amount of offensive odors such that aesthetic enjoyment is hampered
Unsatisfactory	0-2	Prevailing emissions in excess of applicable standards	Prevailing particulate emissions well in excess of applicable standards	An amount of offensive odors such that aesthetic enjoyment is totally deprived

TABLE 3-24

ENVIRONMENTAL RATING DEFINITIONS OF WATER POLLUTION POTENTIAL

Rating	Rating Code	Toxicity	BOD/COD	Thermal and/or Aesthetics
		The material or the material's by-product(s) is (are):	The material or the material's by-product's(s') biological oxygen demand is:	The process causes:
Excellent	9-10	Insoluble in water and contain (s) no toxic constituents	Nil	No thermal or aesthetic pollution
Good	7-8	Insoluble in water and contain (s) an amount of toxic constituents well below applicable standards	Minuscule	Acceptable thermal pollution and/or no aesthetic pollution
Fair	5-6	Insoluble in water and contain(s) an amount of toxic constituents within applicable standards	Low	Acceptable thermal and/or aesthetic pollution
Poor	3-4	Soluble in water and contain (s) an amount of toxic constituents just above applicable standards	Average	Moderately nonacceptable thermal and/or aesthetic pollution
Unsatisfactory	0-2	Soluble in water and contain (s) an amount of toxic constituents well in excess of applicable standards.	High	Nonacceptable thermal and/or aesthetic pollution

TABLE B-25

ENVIRONMENTAL RATING DEFINITION
OF LAND POLLUTION POTENTIAL

Rating	Rating Code	Land Pollution
Excellent	9-10	Disposal will improve land use
Good	7-8	Disposal has no effect on land use
Fair	5-6	Disposal has minimal or temporary effect on land use
Poor	3-4	Disposal has major or permanent effect on land use. Land is suitable only for restricted purposes
Unsatisfactory	0-2	Disposal has major, permanent effect on land use. Land may not be used following disposal

TABLE B-26

ENVIRONMENTAL RATING DEFINITIONS OF RESOURCE DEPLETION POTENTIAL

Rating	Rating Code	Scarcity	Depletion
Excellent	9-10	There is an abundant supply of the material and its substitutes	Integrity of the product is not destroyed; product is reusable in the same process
Good	7-8	There is an adequate supply of the material and its substitutes	Integrity of product is not destroyed but product must be reused in another process
Fair	5-6	There is a diminishing or limited supply of the material but an adequate supply of its substitutes	Product may be converted into new products and used in other processes
Poor	3-4	There is a diminishing or limited supply of the material and its substitutes	The basic material is destroyed but some value (waste heat recovery, for example) is recovered
Unsatisfactory	0-2	There is diminishing or limited supply of the material and it has no substitutes	The basic material is destroyed and no value is recovered

TABLE B-27

NUMERICAL PROCESS EVALUATION MATRIX FOR TETRACHLOROETHYLENE MATERIAL NUMBER 16

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Subtotal	Determined: Total Disposal Rating
Recovery/Reuse	Recovery	0.4	9		3.6	8.7	8.35
	Safety	0.1	7		0.7		
	Residue	0.1	8		0.8		
	Reusability	0.4	9		3.6		
	Air Pollution Potential	0.2		8	1.6	8.0	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		8	1.6		
	Resource Depletion Potential	0.4		8	3.2		
Sanitary Landfill	Processing	0.3	8		2.4	4.5	3 55
	Degradability	0.7	3		2.1		
	Air Pollution Potential	0.2		3	0.6	2.6	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		0	0.0		
	Resource Depletion Potential	0.4		5	2.0		
Incineration	Processing	0.3	5		1.5	5.4	5.60
	Safety	0.1	5		0.5		
	Residue	0.1	9		0.9		
	Combustibility	0.5	5		2.5		
	Air Pollution Potential	0.2		7	1.4	5.8	
	Water Pollution Potential	0.2		6	1.2		
	Land Pollution Potential	0.2		6	1.2		
	Resource Depletion Potential	0.4		5	2.0		
Sea Disposal	Processing	0.3	7		2.1	5.7	4.35
	Residue	0.3	8		2.4		
	Degradability	0.4	3		1.2		
	Air Pollution Potential	0.2		0	0.0	3.0	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		5	2.0		
Microbial Treatment	Processing	0.1	7		0.7	2.7	2.75
	Residue	0.2	3		0.6		
	Degradability	0.7	2		1.4		
	Air Pollution Potential	0.2		0	0.0	2.8	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		5	2.0		

For example, in the operating rating for recovery and reuse, the liquid waste containing tetrachloroethylene is rated 9 for recovery potential (a small still is usually integral to dry cleaning equipment); 7 for safety, since the vapors may be toxic and special procedures are required; 8 for residues, since up to 30 percent waste material, usually dirt, can be found in still bottoms; and 9 for reusability, since the material, less a small amount left in the still bottom, may be reused in the same process. Weighting these values by their relative importance yields the following:

Relative Importance	x	Operational Rating Value	=	Relative Rating
0.4	x	9	=	3.6
0.1	x	7	=	0.7
0.1	x	8	=	0.8
0.4	x	9	=	3.6

(3) Step 3: Subtotal

When the relative ratings for the operational and environmental criteria are summed, it yields the subtotal for each respective relative rating. In this example, the operational relative rating subtotal is 8.7, the corresponding environmental rating subtotal for recovery and reuse of tetrachloroethylene is 8.0.

(4) Step 4: Total Disposal Rating

The total disposal rating for liquid wastes is estimated in the same manner as for solid wastes, which is expressed by the mathematical equation:

$$(C_1 \times OST) + (C_2 \times EST) = TDR$$

where: C_1 and C_2 are constants
$C_1 + C_2 = 1$
OST = Operational Subtotal
EST = Environmental Subtotal
TDR = Total Disposal Rating.

Therefore, the total disposal rating for the example is:

$$(0.5 \times 8.7) + (0.5 \times 8.0) = 8.35$$

For the purpose of this analysis, C_1 and C_2 were chosen to be equally weighted or equally evaluated at 0.5. As in the formula for solid wastes, the values of C_1 and C_2 may be modified to change the importance of one of the criteria. The total disposal rating, as noted on the Summary Fact Sheet, has been rounded to the nearest tenth.

(5) Step 5: Disposal Ranking

As for solid wastes, the recovery or disposal alternatives for liquid wastes are ranked according to the total disposal ratings. The highest total disposal rating (TDR) is the first choice and the other methods follow. Where two or more steps have the same TDR, the processes are given equal ranking. In the illustration the disposal ranking for tetrachloroethylene is as follows:

Recovery/Reuse or Disposal Method	TDR	Disposal Ranking
Recovery/Reuse (Distillation with incineration and landfill or residue)	8.35	1
Sanitary Landfill	3.60	4
Incineration	5.60	2
Sea Disposal	4.40	3
Microbial Treatment (Sewage)	2.75	5

The ranking provides the facility with a variety of means for treatment of the waste with respect to operational and environmental criteria.

APPENDIX C (1)

NUMERICAL PROCESS EVALUATION MATRICES

As mentioned earlier in Chapter I, Section 4 and Appendix B of this report, Numerical Process Evaluation Matrices were constructed to standardize the numerical procedures in evaluating the operational and environmental ratings. This appendix details the determined operational and environmental ratings, and the calculations performed to determine the relative ratings, subtotals, and total disposal ratings for each of the 104 military packaging materials. The results of each matrix, namely, the total disposal rating, have been rounded off to the nearest tenth and transferred to the respective Summary Fact Sheets.

NUMERICAL PROCESS EVALUATION MATRIX FOR ACETONE
MATERIAL NUMBER 1

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Subtotal	Total Disposal Rating
Recovery/Reuse	Recovery	0.4	8		3.2	8.5	8.25
	Safety	0.1	6		0.6		
	Residue	0.1	7		0.7		
	Reusability	0.4	10		4.0		
	Air Pollution Potential	0.2		8	1.6	8.0	
	Water Pollution Potential	0.2		6	1.2		
	Land Pollution Potential	0.2		6	1.2		
	Resource Depletion Potential	0.4		10	4.0		
Sanitary Landfill	Processing	0.3	5		1.5	4.3	4.75
	Degradability	0.7	4		2.8		
	Air Pollution Potential	0.2		8	1.6	5.2	
	Water Pollution Potential	0.2		2	0.4		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Processing	0.3	8		2.4	8.0	7.20
	Safety	0.1	8		0.8		
	Residue	0.1	8		0.8		
	Combustibility	0.5	8		4.0		
	Air Pollution Potential	0.2		8	1.6	6.4	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		8	1.6		
	Resource Depletion Potential	0.4		4	1.6		
Sea Disposal	Processing	0.3	2		0.6	4.6	3.40
	Residue	0.3	8		2.4		
	Degradability	0.4	4		1.6		
	Air Pollution Potential	0.2		2	0.4	2.2	
	Water Pollution Potential	0.2		2	0.4		
	Land Pollution Potential	0.2		3	0.6		
	Resource Depletion Potential	0.4		2	0.8		
Microbial Treatment	Processing	0.1	0		0.0	5.1	3.65
	Residue	0.2	8		1.6		
	Degradability	0.7	5		3.5		
	Air Pollution Potential	0.2		2	0.4	2.2	
	Water Pollution Potential	0.2		2	0.4		
	Land Pollution Potential	0.2		3	0.6		
	Resource Depletion Potential	0.4		2	0.8		

NUMERICAL PROCESS EVALUATION MATRIX FOR BENZENE
MATERIAL NUMBER 2

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Subtotal	Determined: Total Disposal Rating
Recovery/Reuse	Recovery	0.4	8		3.2	8.2	7.90
	Safety	0.1	9		0.9		
	Residue	0.1	9		0.9		
	Reusability	0.4	8		3.2		
	Air Pollution Potential	0.2		8	1.6	7.6	
	Water Pollution Potential	0.2		5	1.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		10	4.0		
Sanitary Landfill	Processing	0.3	8		2.4	5.2	4.00
	Degradability	0.7	4		2.8		
	Air Pollution Potential	0.2		2	0.4	2.8	
	Water Pollution Potential	0.2		4	0.8		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		2	0.8		
Incineration	Processing	0.3	8		2.4	8.2	6.40
	Safety	0.1	9		0.9		
	Residue	0.1	9		0.9		
	Combustibility	0.5	8		4.0		
	Air Pollution Potential	0.2		8	1.6	4.6	
	Water Pollution Potential	0.2		5	1.0		
	Land Pollution Potential	0.2		6	1.2		
	Resource Depletion Potential	0.4		2	0.8		
Sea Disposal	Processing	0.3	8		2.4	6.4	4.60
	Residue	0.3	8		2.4		
	Degradability	0.4	4		1.6		
	Air Pollution Potential	0.2		2	0.4	2.8	
	Water Pollution Potential	0.2		4	0.8		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		2	0.8		
Microbial Treatment	Processing	0.1	7		0.7	5.1	3.95
	Residue	0.2	8		1.6		
	Degradability	0.7	4		2.8		
	Air Pollution Potential	0.2		4	0.8	2.8	
	Water Pollution Potential	0.2		2	0.4		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		2	0.8		

NUMERICAL PROCESS EVALUATION MATRIX FOR CARBON TETRACHLORIDE
MATERIAL NUMBER 3

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Subtotal	Determined: Total Disposal Rating
Recovery/Reuse	Recovery	0.4	9		3.6	8.7	6.55
	Safety	0.1	7		0.7		
	Residue	0.1	8		0.8		
	Reusability	0.4	9		3.6		
	Air Pollution Potential	0.2		8	1.6	8.4	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		6	1.2		
	Resource Depletion Potential	0.4		10	4.0		
Sanitary Landfill	Processing	0.3	8		2.4	4.5	3.55
	Degradability	0.7	3		2.1		
	Air Pollution Potential	0.2		0	0.0	2.6	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		3	0.6		
	Resource Depletion Potential	0.4		5	2.0		
Incineration	Processing	0.3	5		1.5	5.4	5.80
	Safety	0.1	5		0.5		
	Residue	0.1	9		0.9		
	Combustibility	0.5	5		2.5		
	Air Pollution Potential	0.2		9	1.8	6.2	
	Water Pollution Potential	0.2		6	1.2		
	Land Pollution Potential	0.2		6	1.2		
	Resource Depletion Potential	0.4		5	2.0		
Sea Disposal	Processing	0.3	7		2.1	5.7	4.35
	Residue	0.3	8		2.4		
	Degradability	0.4	3		1.2		
	Air Pollution Potential	0.2		0	0.0	3.0	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		5	2.0		
Microbial Treatment	Processing	0.1	7		0.7	2.7	2.75
	Residue	0.2	3		0.6		
	Degradability	0.7	2		1.4		
	Air Pollution Potential	0.2		0	0.0	2.8	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		5	2.0		

NUMERICAL PROCESS EVALUATION MATRIX FOR CORROSION PREVENTIVE MATERIAL NUMBER 4

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Subtotal	Total Disposal Rating
Recovery/Reuse	Recovery	0.4	4		1.6	5.5	6.55
	Safety	0.1	8		0.8		
	Residue	0.1	7		0.7		
	Reusability	0.4	6		2.4		
	Air Pollution Potential	0.2		7	1.4	7.6	
	Water Pollution Potential	0.2		7	1.4		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		10	4.0		
Sanitary Landfill	Processing	0.3	8		2.4	3.8	3.30
	Degradability	0.7	2		1.4		
	Air Pollution Potential	0.2		2	0.4	2.8	
	Water Pollution Potential	0.2		2	0.4		
	Land Pollution Potential	0.2		2	0.4		
	Resource Depletion Potential	0.4		4	1.6		
Incineration	Processing	0.3	8		2.4	8.1	7.55
	Safety	0.1	8		0.8		
	Residue	0.1	9		0.9		
	Combustibility	0.5	8		4.0		
	Air Pollution Potential	0.2		7	1.4	7.0	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		8	1.6		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Processing	0.3	7		2.1	5.0	4.00
	Residue	0.3	7		2.1		
	Degradability	0.4	2		0.8		
	Air Pollution Potential	0.2		3	0.6	3.0	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		4	1.6		
Microbial Treatment	Processing	0.1	7		0.7	3.5	3.35
	Residue	0.2	7		1.4		
	Degradability	0.7	2		1.4		
	Air Pollution Potential	0.2		2	0.4	3.2	
	Water Pollution Potential	0.2		2	0.4		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		4	1.6		

APPENDIX C(6)

NUMBERIAL PROCESS E 'ALUATION MATRIX FOR CORROSION PREVENTIVE—DESSICANT (POWDER)
MATERIAL NUMBER 5

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Subtotal	Total Disposal Rating
Recovery/Reuse	Recovery	0.4	8		3.2	8.5	8.45
	Safety	0.1	8		0.8		
	Residue	0.1	9		0.9		
	Reusability	0.4	9		3.6		
	Air Pollution Potential	0.2		8	1.6	8.4	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		8	1.6		
	Resource Depletion Potential	0.4		9	3.6		
Sanitary Landfill	Processing	0.3	9		2.7	6.9	7.25
	Degradability	0.7	6		4.2		
	Air Pollution Potential	0.2		8	1.6	7.6	
	Water Pollution Potential	0.2		6	1.2		
	Land Pollution Potential	0.2		6	1.2		
	Resource Depletion Potential	0.4		9	3.6		
Incineration	Processing	0.3	9		2.7	4.1	5.65
	Safety	0.1	8		0.8		
	Residue	0.1	1		0.1		
	Combustibility	0.5	1		0.5		
	Air Pollution Potential	0.2		6	1.2	7.2	
	Water Pollution Potential	0.2		6	1.2		
	Land Pollution Potential	0.2		6	1.2		
	Resource Depletion Potential	0.4		9	3.6		
Sea Disposal	Processing	0.3	8		2.4	6.0	6.80
	Residue	0.3	4		1.2		
	Degradability	0.4	6		2.4		
	Air Pollution Potential	0.2		8	1.6	7.6	
	Water Pollution Potential	0.2		6	1.2		
	Land Pollution Potential	0.2		6	1.2		
	Resource Depletion Potential	0.4		9	3.6		
Microbial Treatment	Processing	0.1	6		0.6	5.6	6.60
	Residue	0.2	4		0.8		
	Degradability	0.7	6		4.2		
	Air Pollution Potential	0.2		8	1.6	7.6	
	Water Pollution Potential	0.2		6	1.2		
	Land Pollution Potential	0.2		6	1.2		
	Resource Depletion Potential	0.4		9	3.6		

NUMERICAL PROCESS EVALUATION MATRIX FOR CORROSION PREVENTIVE OIL TYPE VCI (FLUID) MATERIAL NUMBER 6

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Subtotal	Total Disposal Rating
Recovery/Reuse	Recovery	0.4	4		1.6	5.5	6.35
	Safety	0.1	8		0.8		
	Residue	0.1	7		0.7		
	Reusability	0.4	6		2.4		
	Air Pollution Potential	0.2		7	1.4	7.2	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		7	2.8		
Sanitary Landfill	Processing	0.3	6		1.8	4.6	5.3
	Degradability	0.7	4		2.8		
	Air Pollution Potential	0.2		7	1.4	6.0	
	Water Pollution Potential	0.2		7	1.4		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Processing	0.3	8		2.4	7.9	7.15
	Safety	0.1	8		0.8		
	Residue	0.1	7		0.7		
	Combustibility	0.5	8		4.0		
	Air Pollution Potential	0.2		6	1.2	6.4	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		6	1.2		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Processing	0.3	6		1.8	5.2	5.60
	Residue	0.3	6		1.8		
	Degradability	0.4	4		1.6		
	Air Pollution Potential	0.2		7	1.4	6.0	
	Water Pollution Potential	0.2		7	1.4		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		6	2.4		
Microbial Treatment	Processing	0.1	6		0.6	4.6	5.40
	Residue	0.2	6		1.2		
	Degradability	0.7	4		2.8		
	Air Pollution Potential	0.2		7	1.4	6.2	
	Water Pollution Potential	0.2		7	1.4		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		

NUMERICAL PROCESS EVALUATION MATRIX FOR CORROSION PREVENTIVE VCI (SOLID)
MATERIAL NUMBER 7

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Subtotal	Determined: Total Disposal Rating
Recovery/Reuse	Recovery	0.4	4		1.6	5.5	6.25
	Safety	0.1	8		0.8		
	Residue	0.1	7		0.7		
	Reusability	0.4	6		2.4		
	Air Pollution Potential	0.2		6	1.2	7.0	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		7	2.8		
Sanitary Landfill	Processing	0.3	6		1.8	4.6	5.30
	Degradability	0.7	4		2.8		
	Air Pollution Potential	0.2		6	1.2	6.0	
	Water Pollution Potential	0.2		7	1.4		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Processing	0.3	8		2.4	7.9	7.25
	Safety	0.1	8		0.8		
	Residue	0.1	7		0.7		
	Combustibility	0.5	8		4.0		
	Air Pollution Potential	0.2		6	1.2	6.6	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Processing	0.3	6		1.8	4.6	5.40
	Residue	0.3	4		1.2		
	Degradability	0.4	4		1.6		
	Air Pollution Potential	0.2		7	1.4	6.2	
	Water Pollution Potential	0.2		7	1.4		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Microbial Treatment	Processing	0.1	7		0.7	4.3	5.35
	Residue	0.2	4		0.8		
	Degradability	0.7	4		2.8		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		7	1.4		
	Land Pollution Potential	0.2		6	1.2		
	Resource Depletion Potential	0.4		6	2.4		

NUMERICAL PROCESS EVALUATION MATRIX FOR DETERGENT, ALKALI CLEANING COMPOUND (LIQUID)
MATERIAL NUMBER 8

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Subtotal	Determined: Total Disposal Rating
Recovery/Reuse	Recovery	0.4	8		3.2	8.5	8.05
	Safety	0.1	8		0.8		
	Residue	0.1	9		0.9		
	Reusability	0.4	9		3.6		
	Air Pollution Potential	0.2		8	1.6	7.6	
	Water Pollution Potential	0.2		4	0.8		
	Land Pollution Potential	0.2		6	1.2		
	Resource Depletion Potential	0.4		10	4.0		
Sanitary Landfill	Processing	0.3	8		2.4	7.3	6.95
	Degradability	0.7	7		4.9		
	Air Pollution Potential	0.2		8	1.6	6.6	
	Water Pollution Potential	0.2		4	0.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		8	3.2		
Incineration	Processing	0.3	7		2.1	5.3	5.15
	Safety	0.1	9		0.9		
	Residue	0.1	8		0.8		
	Combustibility	0.5	3		1.5		
	Air Pollution Potential	0.2		5	1.0	5.0	
	Water Pollution Potential	0.2		7	1.4		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		3	1.2		
Sea Disposal	Processing	0.3	8		2.4	7.2	5.80
	Residue	0.3	8		2.4		
	Degradability	0.4	6		2.4		
	Air Pollution Potential	0.2		7	1.4	4.4	
	Water Pollution Potential	0.2		3	0.6		
	Land Pollution Potential	0.2		6	1.2		
	Resource Depletion Potential	0.4		3	1.2		
Microbial Treatment	Processing	0.1	8		0.8	6.6	6.30
	Residue	0.2	8		1.6		
	Degradability	0.7	6		4.2		
	Air Pollution Potential	0.2		6	1.2	6.0	
	Water Pollution Potential	0.2		4	0.8		
	Land Pollution Potential	0.2		8	1.6		
	Resource Depletion Potential	0.4		6	2.4		

NUMERICAL PROCESS EVALUATION MATRIX FOR DETERGENT
MATERIAL NUMBER 9

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Subtotal	Total Disposal Rating
Recovery/Reuse	Recovery	0.4	6		2.4	6.5	6.95
	Safety	0.1	10		1.0		
	Residue	0.1	7		0.7		
	Reusability	0.4	6		2.4		
	Air Pollution Potential	0.2		8	1.6	7.4	
	Water Pollution Potential	0.2		4	0.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		10	4.0		
Sanitary Landfill	Processing	0.3	8		2.4	8.0	6.60
	Degradability	0.7	8		5.6		
	Air Pollution Potential	0.2		8	1.6	5.2	
	Water Pollution Potential	0.2		4	0.8		
	Land Pollution Potential	0.2		6	1.2		
	Resource Depletion Potential	0.4		4	1.6		
Incineration	Processing	0.3	7		2.1	5.3	5.15
	Safety	0.1	9		0.9		
	Residue	0.1	8		0.8		
	Combustibility	0.5	3		1.5		
	Air Pollution Potential	0.2		5	1.0	5.0	
	Water Pollution Potential	0.2		7	1.4		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		3	1.2		
Sea Disposal	Processing	0.3	8		2.4	7.6	6.20
	Residue	0.3	8		2.4		
	Degradability	0.4	7		2.8		
	Air Pollution Potential	0.2		7	1.4	4.8	
	Water Pollution Potential	0.2		3	0.6		
	Land Pollution Potential	0.2		6	1.2		
	Resource Depletion Potential	0.4		4	1.6		
Microbial Treatment	Processing	0.1	8		0.8	8.0	7.20
	Residue	0.2	8		1.6		
	Degradability	0.7	8		5.6		
	Air Pollution Potential	0.2		8	1.6	6.4	
	Water Pollution Potential	0.2		4	0.8		
	Land Pollution Potential	0.2		8	1.6		
	Resource Depletion Potential	0.4		6	2.4		

NUMERICAL PROCESS EVALUATION MATRIX FOR GREASE MATERIAL NUMBER 10

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Subtotal	Determined: Total Disposal Rating
Recovery/Reuse	Recovery	0.4	3		1.2	5.0	6.40
	Safety	0.1	7		0.7		
	Residue	0.1	7		0.7		
	Reusability	0.4	6		2.4		
	Air Pollution Potential	0.2		7	1.4	7.8	
	Water Pollution Potential	0.2		5	1.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		10	4.0		
Sanitary Landfill	Processing	0.3	7		2.1	4.2	3.70
	Degradability	0.7	3		2.1		
	Air Pollution Potential	0.2		2	0.4	3.2	
	Water Pollution Potential	0.2		5	1.0		
	Land Pollution Potential	0.2		3	0.6		
	Resource Depletion Potential	0.4		3	1.2		
Incineration	Processing	0.3	8		2.4	8.6	7.00
	Safety	0.1	8		0.8		
	Residue	0.1	9		0.9		
	Combustibility	0.5	9		4.5		
	Air Pollution Potential	0.2		8	1.6	5.4	
	Water Pollution Potential	0.2		6	1.2		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		4	1.6		
Sea Disposal	Processing	0.3	7		2.1	5.8	3.90
	Residue	0.3	7		2.1		
	Degradability	0.4	4		1.6		
	Air Pollution Potential	0.2		0	0.0	2.0	
	Water Pollution Potential	0.2		2	0.4		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		2	0.8		
Microbial Treatment	Processing	0.1	5		0.5	4.9	3.45
	Residue	0.2	8		1.6		
	Degradability	0.7	4		2.8		
	Air Pollution Potential	0.2		0	0.0	2.0	
	Water Pollution Potential	0.2		2	0.4		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		2	0.8		

NUMERICAL PROCESS EVALUATION MATRIX FOR LUBRICATING OIL
MATERIAL NUMBER 11

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Subtotal	Determined: Total Disposal Rating
Recovery/Reuse	Recovery	0.4	3		1.2	5.0	8.40
	Safety	0.1	7		0.7		
	Residue	0.1	7		0.7		
	Reusability	0.4	6		2.4		
	Air Pollution Potential	0.2		7	1.4	7.8	
	Water Pollution Potential	0.2		5	1.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		10	4.0		
Sanitary Landfill	Processing	0.3	7		2.1	4.2	3.70
	Degradability	0.7	3		2.1		
	Air Pollution Potential	0.2		2	0.4	3.2	
	Water Pollution Potential	0.2		5	1.0		
	Land Pollution Potential	0.2		3	0.6		
	Resource Depletion Potential	0.4		3	1.2		
Incineration	Processing	0.3	8		2.4	8.6	7.00
	Safety	0.1	8		0.8		
	Residue	0.1	9		0.9		
	Combustibility	0.5	9		4.5		
	Air Pollution Potential	0.2		8	1.6	5.4	
	Water Pollution Potential	C.2		6	1.2		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		4	1.6		
Sea Disposal	Processing	0.3	7		2.1	5.8	3.90
	Residue	0.3	7		2.1		
	Degradability	0.4	4		1.6		
	Air Pollution Potential	0.2		0	0.0	2.0	
	Water Pollution Potential	0.2		2	0.4		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		2	0.8		
Microbial Treatment	Processing	0.1	5		0.5	4.9	3.45
	Residue	0.2	8		1.6		
	Degradability	0.7	4		2.8		
	Air Pollution Potential	0.2		0	0.0	2.0	
	Water Pollution Potential	0.2		2	0.4		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		2	0.8		

NUMERICAL PROCESS EVALUATION MATRIX FOR METHANOL
MATERIAL NUMBER 12

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Subtotal	Determined: Total Disposal Rating
Recovery/Reuse	Recovery	0.4	6		2.4	6.6	7.50
	Safety	0.1	7		0.7		
	Residue	0.1	7		0.7		
	Reusability	0.4	7		2.8		
	Air Pollution Potential	0.2		8	1.6	3.4	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		6	1.2		
	Resource Depletion Potential	0.4		10	4.0		
Sanitary Landfill	Processing	0.3	8		2.4	5.2	4.40
	Degradability	0.7	4		2.8		
	Air Pollution Potential	0.2		2	0.4	3.6	
	Water Pollution Potential	0.2		2	0.4		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		5	2.0		
Incineration	Processing	0.3	9		2.4	8.0	7.10
	Safety	0.1	8		0.8		
	Residue	0.1	8		0.8		
	Combustibility	0.5	8		4.0		
	Air Pollution Potential	0.2		8	1.6	6.2	
	Water Pollution Potential	0.2		6	1.2		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Sea Disposal	Processing	0.3	8		2.4	6.7	4.75
	Residue	0.3	9		2.7		
	Degradability	0.4	4		1.6		
	Air Pollution Potential	0.2		0	0.0	2.8	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		5	2.0		
Microbial Treatment	Processing	0.1	8		0.8	3.6	3.20
	Residue	0.2	0		0.0		
	Degradability	0.7	4		2.8		
	Air Pollution Potential	0.2		0	0.0	2.8	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		5	2.0		

NUMERICAL PROCESS EVALUATION MATRIX FOR PETROLATUM
MATERIAL NUMBER 13

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Subtotal	Total Disposal Rating
Recovery/Reuse	Recovery	0.4	3		1.2	5.0	6.40
	Safety	0.1	7		0.7		
	Residue	0.1	7		0.7		
	Reusability	0.4	6		2.4		
	Air Pollution Potential	0.2		7	1.4	7.8	
	Water Pollution Potential	0.2		5	1.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		10	4.0		
Sanitary Landfill	Processing	0.3	7		2.1	4.2	3.70
	Degradability	0.7	3		2.1		
	Air Pollution Potential	0.2		2	0.4	3.2	
	Water Pollution Potential	0.2		5	1.0		
	Land Pollution Potential	0.2		3	0.6		
	Resource Depletion Potential	0.4		3	1.2		
Incineration	Processing	0.3	8		2.4	8.6	7.00
	Safety	0.1	8		0.8		
	Residue	0.1	9		0.9		
	Combustibility	0.5	9		4.5		
	Air Pollution Potential	0.2		8	1.6	5.4	
	Water Pollution Potential	0.2		6	1.2		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		4	1.6		
Sea Disposal	Processing	0.3	7		2.1	5.8	3.90
	Residue	0.3	7		2.1		
	Degradability	0.4	4		1.6		
	Air Pollution Potential	0.2		0	0.0	2.0	
	Water Pollution Potential	0.2		2	0.4		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		2	0.8		
Microbial Treatment	Processing	0.1	5		0.5	4.9	3.45
	Residue	0.2	8		1.6		
	Degradability	0.7	4		2.8		
	Air Pollution Potential	0.2		0	0.0	2.0	
	Water Pollution Potential	0.2		2	0.4		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		2	0.8		

NUMERICAL PROCESS EVALUATION MATRIX FOR STODDARD SOLVENT
MATERIAL NUMBER 14

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Subtotal	Total Disposal Rating
Recovery/Reuse	Recovery	0.4	8		3.2	8.2	7.90
	Safety	0.1	9		0.9		
	Residue	0.1	9		0.9		
	Reusability	0.4	8		3.2		
	Air Pollution Potential	0.2		8	1.6	7.6	
	Water Pollution Potential	0.2		5	1.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		10	4.0		
Sanitary Landfill	Processing	0.3	8		2.4	5.2	4.00
	Degradability	0.7	4		2.8		
	Air Pollution Potential	0.2		2	0.4	2.8	
	Water Pollution Potential	0.2		4	0.8		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		2	0.8		
Incineration	Processing	0.3	8		2.4	8.2	6.40
	Safety	0.1	9		0.9		
	Residue	0.1	9		0.9		
	Combustibility	0.5	8		4.0		
	Air Pollution Potential	0.2		8	1.6	4.6	
	Water Pollution Potential	0.2		5	1.0		
	Land Pollution Potential	0.2		6	1.2		
	Resource Depletion Potential	0.4		2	0.8		
Sea Disposal	Processing	0.3	8		2.4	6.4	4.60
	Residue	0.3	8		2.4		
	Degradability	0.4	4		1.6		
	Air Pollution Potential	0.2		2	0.4	2.8	
	Water Pollution Potential	0.2		4	0.8		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		2	0.8		
Microbial Treatment	Processing	0.1	7		0.7	5.1	3.95
	Residue	0.2	8		1.6		
	Degradability	0.7	4		2.8		
	Air Pollution Potential	0.2		4	0.8	2.8	
	Water Pollution Potential	0.2		2	0.4		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		2	0.8		

NUMERICAL PROCESS EVALUATION MATRIX FOR PETROLEUM DISTILLATE
MATERIAL NUMBER 15

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Subtotal	Total Disposal Rating
Recovery/Reuse	Recovery	0.4	7		2.8	7.8	7.50
	Safety	0.1	8		0.8		
	Residue	0.1	6		0.6		
	Reusability	0.4	9		3.6		
	Air Pollution Potential	0.2		8	1.6	7.2	
	Wrter Pollution Potential	0.2		6	1.2		
	Land Pollution Potential	0.2		2	0.4		
	Resource Depletion Potential	0.4		10	4.0		
Sanitary Landfill	Processing	0.3	4		1.2	4.0	4.00
	Degradability	0.7	4		2.8		
	Air Pollution Potential	0.2		4	0.8	4.0	
	Water Pollution Potential	0.2		2	0.4		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		5	2.0		
Incineration	Processing	0.3	6		1.8	7.1	5.85
	Safety	0.1	4		0.4		
	Residue	0.1	9		0.9		
	Combustibility	0.5	8		4.0		
	Air Pollution Potential	0.2		7	1.4	4.6	
	Water Pollution Potential	0.2		2	0.4		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		5	2.0		
Sea Disposal	Processing	0.3	4		1.2	4.9	4.45
	Residue	0.3	7		2.1		
	Degradability	0.4	4		1.6		
	Air Pollution Potential	0.2		4	0.8	4.0	
	Water Pollution Potential	0.2		2	0.4		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		5	2.0		
Microbial Treatment	Processing	0.1	4		0.4	4.6	4.10
	Residue	0.2	7		1.4		
	Degradability	0.7	4		2.8		
	Air Pollution Potential	0.2		3	0.6	3.6	
	Water Pollution Potential	0.2		2	0.4		
	Land Pollution Potential	0.2		3	0.6		
	Resource Depletion Potential	0.4		5	2.0		

NUMERICAL PROCESS EVALUATION MATRIX FOR TETRACHLOROETHYLENE
MATERIAL NUMBER 16

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Subtotal	Total Disposal Rating
Recovery/Reuse	Recovery	0.4	9		3.6	8.7	8.35
	Safety	0.1	7		0.7		
	Residue	0.1	8		0.8		
	Reusability	0.4	9		3.6		
	Air Pollution Potential	0.2		8	1.6	8.0	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		8	1.6		
	Resource Depletion Potential	0.4		8	3.2		
Sanitary Landfill	Processing	0.3	8		2.4	4.5	3.55
	Degradability	0.7	3		2.1		
	Air Pollution Potential	0.2		3	0.6	2.6	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		0	0.0		
	Resource Depletion Potential	0.4		5	2.0		
Incineration	Processing	0.3	5		1.5	5.4	5.60
	Safety	0.1	5		0.5		
	Residue	0.1	9		0.9		
	Combustibility	0.5	5		2.5		
	Air Pollution Potential	0.2		7	1.4	5.8	
	Water Pollution Potential	0.2		6	1.2		
	Land Pollution Potential	0.2		6	1.2		
	Resource Depletion Potential	0.4		5	2.0		
Sea Disposal	Processing	0.3	7		2.1	5.7	4.35
	Residue	0.3	8		2.4		
	Degradability	0.4	3		1.2		
	Air Pollution Potential	0.2		0	0.0	3.0	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		5	2.0		
Microbial Treatment	Processing	0.1	7		0.7	2.7	2.75
	Residue	0.2	3		0.6		
	Degradability	0.7	2		1.4		
	Air Pollution Potential	0.2		0	0.0	2.8	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		5	2.0		

NUMERICAL PROCESS EVALUATION MATRIX FOR TRICHLOROETHYLENE MATERIAL NUMBER 17

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Subtotal	Determined: Total Disposal Rating
Recovery/Reuse	Recovery	0.4	9		3.6	8.7	8.35
	Safety	0.1	7		0.7		
	Residue	0.1	8		0.8		
	Reusability	0.4	9		3.6		
	Air Pollution Potential	0.2		8	1.6	8.0	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		8	1.6		
	Resource Depletion Potential	0.4		8	3.2		
Sanitary Landfill	Processing	0.3	8		2.4	4.5	3.55
	Degradability	0.7	3		2.1		
	Air Pollution Potential	0.2		3	0.6	2.6	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		0	0.0		
	Resource Depletion Potential	0.4		5	2.0		
Incineration	Processing	0.3	5		1.5	5.4	5.60
	Safety	0.1	5		0.5		
	Residue	0.1	9		0.9		
	Combustibility	0.5	5		2.5		
	Air Pollution Potential	0.2		7	1.4	5.8	
	Water Pollution Potential	0.2		6	1.2		
	Land Pollution Potential	0.2		6	1.2		
	Resource Depletion Potential	0.4		5	2.0		
Sea Disposal	Processing	0.3	7		2.1	5.7	4.35
	Residue	0.3	8		2.4		
	Degradability	0.4	3		1.2		
	Air Pollution Potential	0.2		0	0.0	3.0	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		5	2.0		
Microbial Treatment	Processing	0.1	7		0.7	2.7	2.75
	Residue	0.2	3		0.6		
	Degradability	0.7	2		1.4		
	Air Pollution Potential	0.2		0	0.0	2.8	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		4	0.8		
	Resource Depletion Potential	0.4		5	2.0		

Numerical Process Evaluation Matrix
For FIBERGLAS CUSHIONING

Material Number 18

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environ-mental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	3.0	6.50
	Market for Commodity	0.5	3		1.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	2.4	5.70
	Technical Operating Restrictions	0.6	2		1.2		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	10		2.0	3.0	5.60
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	1		0.4		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	8.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		7	2.8		
Composting	Fragmentability	0.2	10		2.0	3.8	6.00
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	3		1.2		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	8.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		7	2.8		
Baling	Compactibility	0.4	1		0.4	5.8	7.00
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	8.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		7	2.8		
Incineration	Fragmentability	0.2	10		2.0	3.3	5.05
	Separability	0.1	3		0.3		
	Combustibility	0.5	0		0.0		
	Potential Damage to Equipment	0.2	5		1.0		
	Air Pollution Potential	0.2		7	1.4	6.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Sanitary Landfill	Fragmentability	0.1	10		1.0	7.6	7.70
	Material Density	0.2	10		2.0		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	2		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		7	2.8		
Sea Disposal	Material Density	0.2	10		2.0	5.6	5.10
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	2		0.6		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.6	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		3	1.2		

Numerical Process Evaluation Matrix
For FIBERGLASS CONTAINER

Material Number 19

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environ-mental Rating	Determined: Relative Rating	Determined: Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	5.0	7.50
	Market for Commodity	0.5	7		3.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	2.4	5.70
	Technical Operating Restrictions	0.6	2		1.2		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	7		1.4	2.4	5.30
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	1		0.4		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	8.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		7	2.8		
Composting	Fragmentability	0.2	7		1.4	3.2	5.70
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	3		1.2		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	8.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		7	2.8		
Baling	Compactibility	0.4	1		0.4	5.8	7.00
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	8.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		7	2.8		
Incineration	Fragmentability	0.2	7		1.4	2.7	4.75
	Separability	0.1	3		0.3		
	Combustibility	0.5	0		0.0		
	Potential Damage to Equipment	0.2	5		1.0		
	Air Pollution Potential	0.2		7	1.4	6.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Sanitary Landfill	Fragmentability	0.1	7		0.7	7.0	7.40
	Material Density	0.2	10		2.0		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	1		0.3		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		7	2.8		
Sea Disposal	Material Density	0.2	10		2.0	5.8	5.10
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	2		0.6		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.6	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		3	1.2		

Numerical Process Evaluation Matrix
For FIBERGLAS CONTAINER

Material Number 20

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	8		4.0	8.5	9.25
	Market for Commodity	0.5	9		4.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	8		3.2	8.8	7.90
	Technical Operating Restrictions	0.6	6		3.6		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	3.6	5.90
	Separability	0.2	8		1.6		
	Chemical Degradability	0.4	1		0.4		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	8.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		7	2.8		
Composting	Fragmentability	0.2	8		1.6	4.4	6.30
	Separability	0.2	8		1.6		
	Biological Degradability	0.4	3		1.2		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	8.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		7	2.8		
Baling	Compactibility	0.4	4		1.6	6.4	7.30
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	8.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		7	2.8		
Incineration	Fragmentability	0.2	8		1.8	3.4	5.10
	Separability	0.1	8		0.8		
	Combustibility	0.5	0		0.0		
	Potential Damage to Equipment	0.2	5		1.0		
	Air Pollution Potential	0.2		7	1.4	8.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Sanitary Landfill	Fragmentability	0.1	8		0.8	7.4	7.60
	Material Density	0.2	10		2.0		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	2		0.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		7	2.8		
Sea Disposal	Material Density	0.2	10		2.0	5.8	5.10
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	2		0.8		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.8	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		3	1.2		

Numerical Process Evaluation Matrix
For VERMICULITE

Material Number 21

Process	Characteristics	Relative Importance	Determined Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	4.0	7.00
	Market for Commodity	0.5	5		2.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	4.8	6.90
	Technical Operating Restrictions	0.6	6		3.6		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	2.4	5.30
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	0		0.0		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	8.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		7	2.8		
Composting	Fragmentability	0.2	10		2.0	2.6	5.40
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	0		0.0		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	8.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		7	2.8		
Baling	Compactibility	0.4	2		0.8	6.8	7.50
	Baleability	0.6	10		6.0		
	Air Pollution Potential	0.2		10	2.0	8.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		7	2.8		
Incineration	Fragmentability	0.2	10		2.0	3.7	5.25
	Separability	0.1	3		0.3		
	Combustibility	0.5	0		0.0		
	Potential Damage to Equipment	0.2	7		1.4		
	Air Pollution Potential	0.2		7	1.4	6.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Sanitary Landfill	Fragmentability	0.1	10		1.0	5.4	6.60
	Material Density	0.2	2		0.4		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		7	2.8		
Sea Disposal	Material Density	0.2	2		0.4	3.4	4.00
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	0		0.0		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.6	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		3	1.2		

Numerical Process Evaluation Matrix
For ALUMINUM TRAY

Material Number 22

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: [illegible]	Determined: Relative Rating	Determined: Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	3.5	6.75
	Market for Commodity	0.5	4		2.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	8.8	7.90
	Technical Operating Restrictions	0.6	9		5.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	3.0	5.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	2		0.8		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Composting	Fragmentability	0.2	8		1.6	2.8	5.00
	Separability	0.2	3		0.8		
	Biological Degradability	0.4	1		0.4		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Baling	Compactibility	0.4	1		0.4	8.4	8.90
	Baleability	0.6	10		6.0		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Incineration	Fragmentability	0.2	8		1.8	4.0	5.00
	Separability	0.1	3		0.3		
	Combustibility	0.5	1		0.5		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		7	1.4	8.0	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		3	1.2		
Sanitary Landfill	Fragmentability	0.1	8		0.8	7.4	7.10
	Material Density	0.2	10		2.0		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	2		0.6		
	Air Pollution Potential	0.2		10	2.0	6.8	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		5	2.0		
Sea Disposal	Material Density	0.2	10		2.0	5.6	4.70
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	2		0.8		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	3.8	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		1	0.4		

Numerical Process Evaluation Matrix
For ALUMINUM CAN

Material Number 23

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	4		2.0	4.0	7.00
	Market for Commodity	0.5	4		2.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	4		1.6	7.0	8.00
	Technical Operating Restrictions	0.6	9		5.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	6		1.6	3.2	5.30
	Separability	0.2	4		0.8		
	Chemical Degradability	0.4	2		0.3		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Composting	Fragmentability	0.2	8		1.6	2.8	5.10
	Separability	0.2	4		0.8		
	Biological Degradability	0.4	1		0.4		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Baling	Compactibility	0.4	10		4.0	9.4	8.40
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Incineration	Fragmentability	0.2	6		1.6	3.6	4.80
	Separability	0.1	4		0.4		
	Combustibility	0.5	0		0.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		7	1.4	6.0	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		3	1.2		
Sanitary Landfill	Fragmentability	0.1	8		0.8	7.4	7.10
	Material Density	0.2	10		2.0		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	2		0.6		
	Air Pollution Potential	0.2		10	2.0	6.8	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		5	2.0		
Sea Disposal	Material Density	0.2	10		2.0	5.6	4.70
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	2		0.6		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	3.8	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		1	0.4		

Numerical Process Evaluation Matrix
For LEAD TUBES

Material Number 24

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	5		2.5	6.0	8.00
	Market for Commodity	0.5	7		3.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	5		2.0	7.4	8.2
	Technical Operating Restrictions	0.6	9		5.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	3		0.6	2.0	4.70
	Separability	0.2	5		1.0		
	Chemical Degradability	0.4	1		0.4		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Composting	Fragmentability	0.2	3		0.6	2.0	4.70
	Separability	0.2	5		1.0		
	Biological Degradability	0.4	1		0.4		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Baling	Compactibility	0.4	5		2.0	3.2	5.30
	Baleability	0.6	2		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Incineration	Fragmentability	0.2	3		0.6	2.5	4.25
	Separability	0.1	5		0.5		
	Combustibility	0.5	0		0.0		
	Potential Damage to Equipment	0.2	7		1.4		
	Air Pollution Potential	0.2		7	1.4	6.0	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		3	1.2		
Sanitary Landfill	Fragmentability	0.1	3		0.3	3.4	5.10
	Material Density	0.2	10		2.0		
	Compactibility	0.4	2		0.8		
	Biological Degradability	0.3	1		0.3		
	Air Pollution Potential	0.2		10	2.0	6.8	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		5	2.0		
Sea Disposal	Material Density	0.2	10		2.0	2.9	3.35
	Compactibility	0.3	2		0.6		
	Biological Degradability	0.3	1		0.3		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	3.8	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		1	0.4		

Numerical Process Evaluation Matrix
For STEEL CYLINDER
Material Number 25

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environ-mental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	9		4.5	8.0	9.00
	Market for Commodity	0.5	7		3.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	9		3.6	4.8	6.90
	Technical Operating Restrictions	0.6	2		1.2		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	1		0.2	2.8	5.10
	Separability	0.2	9		1.8		
	Chemical Degradability	0.4	2		0.8		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Composting	Fragmentability	0.2	1		0.2	2.4	4.90
	Separability	0.2	9		1.8		
	Biological Degradability	0.4	1		0.4		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Baling	Compactibility	0.4	10		4.0	5.8	6.60
	Baleability	0.6	3		1.8		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Incineration	Fragmentability	0.2	1		0.2	1.5	3.80
	Separability	0.1	9		0.9		
	Combustibility	0.5	0		0.0		
	Potential Damage to Equipment	0.2	2		0.4		
	Air Pollution Potential	0.2		7	1.4	6.0	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		3	1.2		
Sanitary Landfill	Fragmentability	0.1	1		0.1	3.6	5.20
	Material Density	0.2	10		2.0		
	Compactibility	0.4	3		1.2		
	Biological Degradability	0.3	1		0.3		
	Air Pollution Potential	0.2		10	2.0	6.8	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		5	2.0		
Sea Disposal	Material Density	0.2	10		2.0	3.7	3.80
	Compactibility	0.3	3		0.9		
	Biological Degradability	0.3	1		0.3		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	3.8	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		1	0.4		

Numerical Process Evaluation Matrix
For Steel Drum

Material Number 26

			Determined				
Process	**Characteristics**	**Relative Importance**	**Operational Rating**	**Environ-mental Rating**	**Relative Rating**	**Sub-Total**	**Total Disposal Rating**
Direct Reuse	Separability	0.5	10		10.0	10.0	10.00
	Market for Commodity	0.5	10		10.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	10		4.0	7.6	8.30
	Technical Operating Restrictions	0.6	6		3.6		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	4		0.8	3.6	5.50
	Separability	0.2	10		2.0		
	Chemical Degradability	0.4	2		0.8		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Composting	Fragmentability	0.2	4		0.8	3.2	5.30
	Separability	0.2	10		2.0		
	Biological Degradability	0.4	1		0.4		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Baling	Compactibility	0.4	10		4.0	7.6	7.50
	Baleability	0.6	6		3.6		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Inciner-ation	Fragmentability	0.2	4		0.8	3.2	4.60
	Separability	0.1	10		1.0		
	Combustibility	0.5	0		0.0		
	Potential Damage to Equipment	0.2	7		1.4		
	Air Pollution Potential	0.2		7	1.4	6.0	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		3	1.2		
Sanitary Landfill	Fragmentability	0.1	4		0.4	5.3	6.05
	Material Density	0.2	10		2.0		
	Compactibility	0.4	5		2.0		
	Biological Degradability	0.3	3		0.9		
	Air Pollution Potential	0.2		10	2.0	6.8	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		5	2.0		
Sea Disposal	Material Density	0.2	10		2.0	4.4	4.10
	Compactibility	0.3	5		1.5		
	Biological Degradability	0.3	3		0.9		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	3.8	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		1	0.4		

Numerical Process Evaluation Matrix
For Metal Strap

Material Number 27

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	1		0.5	1.0	5.50
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	9		3.6	9.0	9.00
	Technical Operating Restrictions	0.6	9		5.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	1		0.2	2.8	5.10
	Separability	0.2	9		1.8		
	Chemical Degradability	0.4	2		0.8		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Composting	Fragmentability	0.2	1		0.2	2.4	4.90
	Separability	0.2	9		1.8		
	Biological Degradability	0.4	1		0.4		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Baling	Compactibility	0.4	1		0.4	2.2	4.80
	Baleability	0.6	3		1.8		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Incineration	Fragmentability	0.2	1		0.2	2.5	4.25
	Separability	0.1	9		0.9		
	Combustibility	0.5	0		0.0		
	Potential Damage to Equipment	0.2	7		1.4		
	Air Pollution Potential	0.2		7	1.4	6.0	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		3	1.2		
Sanitary Landfill	Fragmentability	0.1	1		0.1	4.6	5.70
	Material Density	0.2	10		2.0		
	Compactibility	0.4	4		1.6		
	Biological Degradability	0.3	3		0.9		
	Air Pollution Potential	0.2		10	2.0	6.8	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		5	2.0		
Sea Disposal	Material Density	0.2	10		2.0	4.1	3.95
	Compactibility	0.3	4		1.2		
	Biological Degradability	0.3	3		0.9		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	3.8	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		1	0.4		

Numerical Process Evaluation Matrix
For Tin Can (Steel)

Material Number 28

Process	Characteristics	Relative Importance	Determined Operational Rating	Determined Environmental Rating	Determined Relative Rating	Determined Sub-Total	Determined Total Disposal Rating
Direct Reuse	Separability	0.5	10		5.0	8.5	9.25
	Market for Commodity	0.5	7		3.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	10		4.0	8.8	8.90
	Technical Operating Restrictions	0.6	8		4.8		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	6		1.2	4.0	5.70
	Separability	0.2	10		2.0		
	Chemical Degradability	0.4	2		0.8		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Composting	Fragmentability	0.2	6		1.2	3.8	5.60
	Separability	0.2	10		2.0		
	Biological Degradability	0.4	1		0.4		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Baling	Compactibility	0.4	10		4.0	9.4	8.40
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Incineration	Fragmentability	0.2	6		1.2	3.8	4.90
	Separability	0.1	10		1.0		
	Combustibility	0.5	0		0.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		7	1.4	6.0	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		3	1.2		
Sanitary Landfill	Fragmentability	0.1	6		0.6	7.2	7.00
	Material Density	0.2	10		2.0		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	2		0.6		
	Air Pollution Potential	0.2		10	2.0	6.8	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		5	2.0		
Sea Disposal	Material Density	0.2	10		2.0	5.6	4.70
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	2		0.6		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	3.8	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		1	0.4		

Numerical Process Evaluation Matrix
For TIN-PLATED STEEL/ALUMINUM CAN

Material Number 29

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	10		5.0	6.5	9.25
	Market for Commodity	0.5	7		3.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	10		4.0	8.8	8.90
	Technical Operating Restrictions	0.6	8		4.8		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	6		1.2	4.0	5.70
	Separability	0.2	10		2.0		
	Chemical Degradability	0.4	2		0.8		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Composting	Fragmentability	0.2	6		1.2	3.6	5.50
	Separability	0.2	10		2.0		
	Biological Degradability	0.4	1		0.4		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Baling	Compactibility	0.4	10		4.0	9.4	8.40
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Incineration	Fragmentability	0.2	6		1.2	3.6	4.90
	Separability	0.1	10		1.0		
	Combustibility	0.5	0		0.0		
	Potential Damage to Equipment	0.2	6		1.6		
	Air Pollution Potential	0.2		7	1.4	6.0	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		3	1.2		
Sanitary Landfill	Fragmentability	0.1	6		0.6	7.2	7.00
	Material Density	0.2	10		2.0		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	2		0.6		
	Air Pollution Potential	0.2		10	2.0	6.8	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		5	2.0		
Sea Disposal	Material Density	0.2	10		2.0	5.6	4.70
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	2		0.6		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2	10		2.0	3.8	
	Water Pollution Potential	0.2	0		0.0		
	Land Pollution Potential	0.2	7		1.4		
	Resource Depletion Potential	0.4	1		0.4		

Numerical Process Evaluation Matrix
For AEROSOLS/PRESSURIZED CAN

Material Number 30

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environ-mental Rating	Relative Rating	Sub Total	Total Disposal Rating
Direct Reuse	Separability	0.5	9		4.5	5.0	7.50
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	9		3.6	4.6	6.90
	Technical Operating Restrictions	0.6	2		1.2		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	1		0.2	2.6	5 [illegible]
	Separability	0.2	9		1.6		
	Chemical Degradability	0.4	2		0.8		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Composting	Fragmentability	0.2	1		0.2	2.4	4.90
	Separability	0.2	9		1.6		
	Biological Degradability	0.4	1		0.4		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Baling	Compactibility	0.4	10		4.0	5.6	6.60
	Baleability	0.6	3		1.6		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		5	2.0		
Incineration	Fragmentability	0.2	1		0.2	1.5	3.75
	Separability	0.1	9		0.9		
	Combustibility	0.5	0		0.0		
	Potential Damage to Equipment	0.2	2		0.4		
	Air Pollution Potential	0.2		7	1.4	6.0	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		3	1.2		
Sanitary Landfill	Fragmentability	0.1	1		0.1	3.6	5.20
	Material Density	0.2	10		2.0		
	Compactibility	0.4	3		1.2		
	Biological Degradability	0.3	1		0.3		
	Air Pollution Potential	0.2		10	2.0	6.6	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		5	2.0		
Sea Disposal	Material Density	0.2	10		2.0	3.2	3.50
	Compactibility	0.3	3		0.9		
	Biological Degradability	0.3	1		0.3		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	3.6	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		1	0.4		

Numerical Process Evaluation Matrix
For Coated Corrugated Container

Material Number 31

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	7		3.5	8.5	9.25
	Market for Commodity	0.5	10		5.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	7		2.8	5.2	7.10
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	7		1.4	7.8	7.80
	Separability	0.2	7		1.4		
	Chemical Degradability	0.4	10		4.0		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	7		1.4	8.2	7.00
	Separability	0.2	7		1.4		
	Biological Degradability	0.4	7		2.8		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	10		4.0	9.4	8.80
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	7		1.4	9.1	7.75
	Separability	0.1	7		0.7		
	Combustibility	0.5	10		5.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	7		0.7	7.2	7.10
	Material Density	0.2	4		0.8		
	Compactibility	0.4	9		3.6		
	Biological Degradability	0.3	7		2.1		
	Air Pollution Potential	0.2		10	2.0	7.0	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	4		0.8	5.6	4.90
	Compactibility	0.3	9		2.7		
	Biological Degradability	0.3	7		2.1		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For Corrugated Container

Material Number 32

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	7		3.5	8.5	9.25
	Market for Commodity	0.5	10		5.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	7		2.8	7.0	8.00
	Technical Operating Restrictions	0.6	7		4.2		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	7		1.4	7.8	7.80
	Separability	0.2	7		1.4		
	Chemical Degradability	0.4	10		4.0		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	7		1.4	6.6	7.20
	Separability	0.2	7		1.4		
	Biological Degradability	0.4	8		3.2		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	10		4.0	9.4	8.60
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	7		1.4	9.1	7.75
	Separability	0.1	7		0.7		
	Combustibility	0.5	10		5.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	7		0.7	6.9	6.95
	Material Density	0.2	1		0.2		
	Compactibility	0.4	9		3.6		
	Biological Degradability	0.3	8		2.4		
	Air Pollution Potential	0.2		10	2.0	7.0	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	1		0.2	5.0	4.60
	Compactibility	0.3	9		2.7		
	Biological Degradibility	0.3	7		2.1		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		[illegible]	0.8		

Numerical Process Evaluation Matrix
For Wax Impregnated Paper

Material Number 33

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environ-mental Rating	Determined: Relative Rating	Determined: Sub-Total	Determined: Total Disposal Rating
Direct Reuse	Separability	0.5	7		3.5	8.5	9.25
	Market for Commodity	0.5	10		5.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	7		2.8	5.2	7.10
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	7		1.4	7.8	7.80
	Separability	0.2	7		1.4		
	Chemical Degradability	0.4	10		4.0		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	7		1.4	6.2	7.00
	Separability	0.2	7		1.4		
	Biological Degradability	0.4	7		2.8		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	10		4.0	9.4	8.60
	Balesbility	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	7		1.4	9.1	7.75
	Separability	0.1	7		0.7		
	Combustibility	0.5	10		5.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	7		0.7	7.2	7.10
	Material Density	0.2	4		0.8		
	Compactibility	0.4	9		3.6		
	Biological Degradability	0.3	7		2.1		
	Air Pollution Potential	0.2		10	2.0	7.0	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	4		0.8	5.6	4.90
	Compactibility	0.3	9		2.7		
	Biological Degradability	0.3	7		2.1		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For Paper Bag

Material Number 34

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	4		2.0	5.5	7.75
	Market for Commodity	0.5	7		3.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	4		1.6	5.2	7.10
	Technical Operating Restrictions	0.6	6		3.6		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	7.4	7.60
	Separability	0.2	4		0.8		
	Chemical Degradability	0.4	10		4.0		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	8		1.6	6.2	7.00
	Separability	0.2	4		0.8		
	Biological Degradability	0.4	8		3.2		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	5		2.0	7.4	7.60
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	8		1.6	9.0	7.70
	Separability	0.1	4		0.4		
	Combustibility	0.5	10		5.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	8		0.8	7.6	7.30
	Material Density	0.2	4		0.8		
	Compactibility	0.4	9		3.6		
	Biological Degradability	0.3	8		2.4		
	Air Pollution Potential	0.2		10	2.0	7.0	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	4		0.8	5.9	5.05
	Compactibility	0.3	9		2.7		
	Biological Degradability	0.3	8		2.4		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For Impregnated Paper

Material Number 35

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	7		3.5	8.5	9.25
	Market for Commodity	0.5	10		5.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	7		2.8	5.2	7.10
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	7		1.4	7.8	7.80
	Separability	0.2	7		1.4		
	Chemical Degradability	0.4	10		4.0		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	7		1.4	6.2	7.00
	Separability	0.2	7		1.4		
	Biological Degradability	0.4	7		2.8		
	Technical Operating Restrictions	0.2	3		0.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	4		1.6	7.0	7.40
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	7		1.4	9.1	7.75
	Separability	0.1	7		0.7		
	Combustibility	0.5	10		5.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	7		0.7	7.2	7.10
	Material Density	0.2	4		0.8		
	Compactibility	0.4	9		3.6		
	Biological Degradability	0.3	7		2.1		
	Air Pollution Potential	0.2		10	2.0	7.0	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	4		0.8	5.6	4.90
	Compactibility	0.3	9		2.7		
	Biological Degradability	0.3	7		2.1		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For Converting Paper

Material Number 36

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	1.5	5.75
	Market for Commodity	0.5	0		0.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	3.6	6.30
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	6.6	7.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	8		3.2		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	5.2	8.50
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	6		2.4		
	Technical Operating Restrictions	0.2	2		0.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	1		0.4	6.4	7.10
	Baleability	0.6	10		6.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.8	9.1	7.75
	Separability	0.1	3		0.3		
	Combustibility	0.5	10		5.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	7.7	7.35
	Material Density	0.2	5		1.0		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	6		1.8		
	Air Pollution Potential	0.2		10	2.0	7.0	
	Water Pollution Potential	0.2		3	1.6		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	5		1.0	5.6	5.00
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	6		1.8		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For Newsprint Wrapping

Material Number 37

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	2		1.0	3.5	6.75
	Market for Commodity	0.5	5		2.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	2		0.8	3.6	6.40
	Technical Operating Restrictions	0.6	5		3.0		
	Resource Depletion Potential	1.0		9	9.0	0.0	
Pyrolysis	Fragmentability	0.2	10		2.0	7.4	7.60
	Separability	0.2	2		0.4		
	Chemical Degradability	0.4	10		4.0		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Compounting	Fragmentability	0.2	10		2.0	6.2	7.00
	Separability	0.2	2		0.4		
	Biological Degradability	0.4	8		3.2		
	Technical Operating Restrictions	0.2	3		0.8		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Baling	Compactibility	0.4	2		0.8	6.8	7.30
	Baleability	0.6	10		6.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	10		2.0	9.2	7.80
	Separability	0.1	2		0.2		
	Combustibility	0.5	10		5.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	10		1.0	8.2	7.60
	Material Density	0.2	4		0.8		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	8		2.4		
	Air Pollution Potential	0.2		10	2.0	7.0	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	4		0.8	6.2	5.20
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	8		2.4		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For Pulp Tray

Material Number 38

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Sub-Total	Determined: Total Disposal Rating
Direct Reuse	Separability	0.5	2		1.0	4.5	7.25
	Market for Commodity	0.5	7		3.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	2		0.8	5.0	7.00
	Technical Operating Restrictions	0.6	7		4.2		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	7.0	7.40
	Separability	0.2	2		0.4		
	Chemical Degradability	0.4	10		4.0		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	8		1.8	5.8	6.80
	Separability	0.2	2		0.4		
	Biological Degradability	0.4	8		3.2		
	Technical Operating Restrictions	0.2	3		0.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	1		0.4	5.8	6.80
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.[illegible]	[illegible]		1.8	7.8	7.10
	Separability	0.1	2		0.2		
	Combustibility	0.5	8		4.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	8.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	8		0.8	8.0	7.50
	Material Density	0.2	4		0.8		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	8		2.4		
	Air Pollution Potential	0.2		10	2.0	7.0	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	4		0.8	8.[illegible]	5.20
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	8		2.4		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For Tissue Paper

Material Number 39

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	4		2.0	4.5	7.25
	Market for Commodity	0.5	5		2.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	4		1.6	5.8	7.40
	Technical Operating Restrictions	0.6	7		4.2		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.8	7.4	7.60
	Separability	0.2	4		0.8		
	Chemical Degradability	0.4	10		4.0		
	Technical Operating Restrictions	0.3	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	8		1.6	5.8	6.80
	Separability	0.2	4		0.8		
	Biological Degradability	0.4	7		2.8		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	2		0.8	6.8	7.30
	Baleability	0.6	10		6.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	6		1.6	9.0	7.70
	Separability	0.1	4		0.4		
	Combustibility	0.5	10		5.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmen[illegible]	0.1	6		0.8	7.3	7.15
	Material [illegible]	0.2	2		0.4		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	7		2.1		
	Air Pollution Potential	0.2		10	2.0	7.0	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	2		0.4	5.5	4.85
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	7		2.1		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For VCI PACKAGING MATERIALS

Material Number 40

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	7		3.5	8.0	9.00
	Market for Commodity	0.5	9		4.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	7		2.8	5.2	7.10
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	7		1.4	7.8	7.80
	Separability	0.2	7		1.4		
	Chemical Degradability	0.4	10		4.0		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Composting	Fragmentability	0.2	7		1.4	8.2	7.00
	Separability	0.2	7		1.4		
	Biological Degradability	0.4	7		2.8		
	Technical Operating Restrictions	0.2	3		0.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Baling	Compactibility	0.4	10		4.0	9.4	8.60
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	7		1.4	9.1	7.75
	Separability	0.1	7		0.7		
	Combustibility	0.5	10		5.0		
	Potential Damage to Equipment	0.2			2.0		
	Air Pollution Potential	0.2		7	1.4	8.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.8		
Sanitary Landfill	Fragmentability	0.1	7		0.7	7.2	7.10
	Material Density	0.2	4		0.8		
	Compactibility	0.4	9		3.8		
	Biological Degradability	0.3	7		2.1		
	Air Pollution Potential	0.2		10	2.0	7.0	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	4		0.8	5.6	4.90
	Compactibility	0.3	9		2.7		
	Biological Degradability	0.3	7		2.1		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For WAX PAPER

Material Number 41

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	4.0	7.00
	Market for Commodity	0.5	5		2.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	3.0	8.00
	Technical Operating Restrictions	0.6	3		1.8		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	10		2.0	6.4	7.10
	Separability	0.2	3		0.8		
	Chemical Degradability	0.4	7		2.8		
	Technicel Operating Restrictions	0.2	8		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		[illegible]	1.4		
	Resource Depletion Potential	0.4		[illegible]	2.4		
Composting	Fragmentability	0.2	10		2.0	5.2	6.50
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	8		2.0		
	Technical Operating Restrictions	0.2	3		0.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	1		0.4	6.4	7.10
	Baleability	0.6	10		6.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	10		2.0	8.8	7.60
	Separability	0.1	3		0.3		
	Combustibility	0.5	9		4.5		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	10		1.0	7.3	7.15
	Material Density	0.2	4		0.8		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	6		1.8		
	Air Pollution Potential	0.2		10	2.0	7.0	
	Water Pollution Potential	0.2		8	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	4		0.8	5.3	4.75
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	5		1.5		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.[illegible]		2	0.8		

Numerical Process Evaluation Matrix
For Wrapping Paper
Material Number 48

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	4		2.0	4.5	7.25
	Market for Commodity	0.5	5		2.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	4		1.6	5.8	7.40
	Technical Operating Restrictions	0.6	7		4.2		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	7.4	7.80
	Separability	0.2	4		0.8		
	Chemical Degradability	0.4	10		4.0		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	8		1.6	6.2	7.00
	Separability	0.2	4		0.8		
	Biological Degradability	0.4	8		3.2		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	4		1.6	7.0	7.40
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	8		1.6	9.0	7.70
	Separability	0.1	4		0.4		
	Combustibility	0.5	10		5.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	8		0.8	8.0	7.50
	Material Density	0.2	4		0.8		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	8		2.4		
	Air Pollution Potential	0.2		10	2.0	7.0	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	4		0.8	6.2	5.20
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	8		2.4		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For Chipboard Box

Material Number 43

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	4		2.0	6.5	8.25
	Market for Commodity	0.5	9		4.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	4		1.6	7.0	8.00
	Technical Operating Restrictions	0.6	9		5.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	7.4	7.80
	Separability	0.2	4		0.8		
	Chemical Degradability	0.4	10		4.0		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	8		1.8	8.2	7.00
	Separability	0.2	4		0.8		
	Biological Degradability	0.4	8		3.2		
	Technical Operating Restrictions	0.2	3		0.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	10		4.0	9.4	8.60
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	6		1.8	9.0	7.70
	Separability	0.1	4		0.4		
	Combustibility	0.5	10		5.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	6		0.8	8.0	7.50
	Material Density	0.2	4		0.8		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	6		2.4		
	Air Pollution Potential	0.2		10	2.0	7.0	
	Water Pollution Potential	0.2		8	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	4		0.8	8.2	5.20
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	8		2.4		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For SPIRALLY WOUND FIBER CAN

Material Number 4*

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	7		3.5	8.5	9.25
	Market for Commodity	0.5	10		5.0		
	Resource Depletion Potential	1.0		10	10.0	1[illegible].0	
Recycle	Separability	0.4	7		2.8	3.4	8.20
	Technical Operating Restrictions	0.6	1		0.6		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.2	8.4	7.10
	Separability	0.2	7		1.4		
	Chemical Degradability	0.4	7		2.3		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Composting	Fragmentability	0.2	8		1.2	4.8	8.30
	Separability	0.2	7		1.4		
	Biological Degradability	0.4	4		1.8		
	Technical Operating Restrictions	0.2	3		0.8		
	Air Pollution Potential	0.2		10	2.0	7.[illegible]	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Baling	Compactibility	0.4	10		4.0	0.8	8.30
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Incineration	Fragmentability	0.2	8		1.2	8.4	7.40
	Separability	0.1	7		0.7		
	Combustibility	0.5	9		4.5		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.8		
Sanitary Landfill	Fragmentability	0.1	8		0.8	6.8	6.80
	Material Density	0.2	5		1.0		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	6.8	
	Water Pollution Potential	0.2		7	1.4		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		8	2.4		
Sea Disposal	Material Density	0.2	5		1.0	5.2	4.70
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.[illegible]	4.2	
	Water Pollution Potential	0.2		0	[illegible]		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For POLYOLEFIN/FOIL/PAPER

Material Number 45

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environ-mental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.0	6.00
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	1.6	5.40
	Technical Operating Restrictions	0.6	1		0.6		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	4.6	6.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.6	4.0	5.90
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	1		0.4	5.2	6.50
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0 [illegible]	9		1.8	5.2	5.70
	Separability	0.1	3		0.3		
	Combustibility	0.5	3		1.5		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.9	6.65
	Material Density	0.2	7		1.4		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	7		1.4	4.4	4.20
	Compactibility	0.3	6		1.6		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For Paperboard Box

Material Number 48

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	7		3.5	6.5	9.25
	Market for Commodity	0.5	10		5.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	7		2.8	5.8	7.40
	Technical Operating Restrictions	0.6	5		3.0		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	7		1.4	7.4	7.60
	Separability	0.2	7		1.4		
	Chemical Degradability	0.4	9		3.6		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	7		1.4	4.2	6.00
	Separability	0.2	7		1.4		
	Biological Degradability	0.4	2		0.8		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	10		4.0	8.8	8.30
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	7		1.4	8.6	7.50
	Separability	0.1	7		0.7		
	Combustibility	0.5	9		4.5		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	7		0.7	6.6	6.60
	Material Density	0.2	4		0.8		
	Compactibility	0.4	9		3.6		
	Biological Degradability	0.3	5		1.5		
	Air Pollution Potential	0.2		10	2.0	7.0	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	4		0.8	5.0	4.60
	Compactibility	0.3	9		2.7		
	Biological Degradability	0.3	5		1.5		
	Regulatory Operational Restrictions	0.[illegible]	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For METAL EDGED PAPERBOARD

Material Number 47

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	7		3.5	8.5	9.25
	Market for Commodity	0.5	10		5.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	7		2.8	5.8	7.40
	Technical Operating Restrictions	0.6	5		3.0		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	7		1.4	7.4	7.60
	Separability	0.2	7		1.4		
	Chemical Degradability	0.4	9		3.6		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	7		1.4	4.2	6.00
	Separability	0.2	7		1.4		
	Biological Degradability	0.4	2		0.8		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	[illegible]	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	10		4.0	8.8	8.30
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	[illegible]		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	7		1.4	8.6	7.50
	Separability	0.1	7		0.7		
	Combustibility	0.5	9		4.5		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	7		0.7	6.6	6.80
	Material Density	0.2	4		0.8		
	Compactibility	0.4	9		3.6		
	Biological Degradability	0.3	5		1.5		
	Air Pollution Potential	0.2		10	2.0	7.0	
	Water Pollution Potential	0.2		8	1.6		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	[illegible]		
Sea Disposal	Material Density	0.2	4		0.8	5.0	4.60
	Compactibility	0.3	9		2.7		
	Biological Degradability	0.3	5		1.5		
	Regulatory Operational Restrictions	0	0		0.0		
	Air Pollution Potential	[illegible]		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For WOOD CLEATED FIBERBOARD

Material Number 48

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environ-mental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	7		3.5	8.5	9.25
	Market for Commodity	0.5	10		5.0		
	Resource Depletion Potential	1.0		10	10 0	10.0	
Recycle	Separability	0.4	7		2.8	4.0	6.50
	Technical Operating Restrictions	0.6	2		1.2		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	6		1.2	7.8	7.70
	Separability	0.2	7		1.4		
	Chemical Degradability	0.4	10		4.0		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Compost-ing	Fragmentability	0.2	6		1.2	6.2	7.00
	Separability	0.2	7		1.4		
	Biological Degradability	0.4	7		2.8		
	Technical Operating Restrictions	0.2	4		0.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Baling	Compactibility	0.4	10		4.0	8.8	8.30
	Balebility	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Incinera-tion	Fragmentability	0.2	8		1.2	7.9	7.15
	Separability	0.1	7		0.7		
	Combustibility	0.5	8		4.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	8.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.8		
Sanitary Landfill	Fragmentability	0.1	8		0.8	6.7	6.95
	Material Density	0.2	2		0.4		
	Compactibility	0.4	9		3.6		
	Biological Degradability	0.3	7		2.1		
	Air Pollution Potential	0.2		10	2.0	7.2	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	2		0.4	5.2	4.70
	Compactibility	0.3	9		2.7		
	Biological Degradability	0.3	7		2.1		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For ABS Tray

Material Number 49

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	5		2.5	4.5	7.25
	Market for Commodity	0.5	4		2.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	5		2.0	4.4	6.70
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		5	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	4.6	6.30
	Separability	0.2	5		1.0		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	8		1.6	4.2	6.00
	Separability	0.2	5		1.0		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	9		3.6	6.6	7.20
	Baleability	0.6	5		3.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	6		1.6	6.7	6.45
	Separability	0.1	5		0.5		
	Combustibility	0.5	6		3.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	8		0.8	6.0	6.70
	Material Density	0.2	6		1.2		
	Compactibility	0.4	7		2.8		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	6		1.2	4.5	4.35
	Compactibility	0.3	7		2.1		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For Cellophane Wrapping

Material Number 50

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.0	6.00
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	3.6	6.30
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	4.6	6.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.0	5.90
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	2		0.8	5.6	6.70
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.8	7.7	6.95
	Separability	0.1	3		0.3		
	Combustibility	0.5	8		4.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	6.1	6.75
	Material Density	0.2	8		1.6		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	8		1.6	4.6	4.40
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For Cellulose Cushioning

Material Number 51

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	4		2.0	2.5	6.25
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	4		1.6	4.0	6.50
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.6	4.6	6.30
	Separability	0.2	4		0.8		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.2	8.00
	Separability	0.2	4		0.8		
	Biological Degradability	0.4	4		1.8		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	2		0.8	5.6	6.70
	Baleability	0.6	6		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Incineration	Fragmentability	0.2	9		1.6	6.8	6.50
	Separability	0.1	4		0.4		
	Combustibility	0.5	6		3.0		
	Potential Damage to Equipment	0.3	6		1.8		
	Air Pollution Potential	0.2		6	1.2	8.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	4.9	8.15
	Material Density	0.2	2		0.4		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	2		0.4	3.4	3.80
	Compactibility	0.3	6		1.6		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For Cellulose Wrapping

Material Number 52

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Sub-Total	Determined: Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.0	6.00
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	3.6	6.30
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.6	4.6	6.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.0	5.90
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	2		0.6	5.6	6.70
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.6	5.7	5.95
	Separability	0.1	3		0.3		
	Combustibility	0.5	4		2.0		
	Potential Damage to Equipment	0.2	6		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.7	6.55
	Material Density	0.2	6		1.2		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	6		1.2	4.2	4.20
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For Cellulose Container

Material Number 53

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environ-mental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	5		2.5	4.5	7.25
	Market for Commodity	0.5	4		2.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	5		2.0	4.4	6.70
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	4.8	6.30
	Separability	0.2	5		1.0		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Compost-ing	Fragmentability	0.2	8		1.6	4.2	8.00
	Separability	0.2	5		1.0		
	Biological Degradability	0.4	4		1.8		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Baling	Compactibility	0.4	10		4.0	7.0	7.40
	Baleability	0.6	5		3.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incinera-tion	Fragmentability	0.2	6		1.6	6.7	6.45
	Separability	0.1	5		0.5		
	Combustibility	0.5	6		3.0		
	Potential Damage to Equipment	0.2	6		1.8		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	8		0.8	6.2	6.80
	Material Density	0.2	7		1.4		
	Compactibility	0.4	7		2.8		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	7		1.4	4.7	4.45
	Compactibility	0.3	7		2.1		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.6		

Numerical Process Evaluation Matrix
For Strippable Coating-Cold

Material Number 54

Process	Characteristics	Relative Importance	Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
			Determined				
Direct Reuse	Separability	0.5	2		1.0	1.0	5.50
	Market for Commodity	0.5	0		0.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	2		0.8	0.8	4.90
	Technical Operating Restrictions	0.6	0		0.0		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	3.8	5.80
	Separability	0.2	2		0.4		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	3.8	5.80
	Separability	0.2	2		0.4		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	1		0.4	5.2	6.50
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.8	5.8	5.90
	Separability	0.1	2		0.2		
	Combustibility	0.5	4		2.0		
	Potential Damage to Equipment	0.2	8		1.8		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.7	6.55
	Material Density	0.2	6		1.2		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	6		1.2	4.2	4.20
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For Strippable Coating-Hot

Material Number 55

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	2		1.0	1.0	3.50
	Market for Commodity	0.5	0		0.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	2		0.8	0.8	4.90
	Technical Operating Restrictions	0.6	0		0.0		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	3.8	5.80
	Separability	0.2	2		0.4		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	3.8	5.80
	Separability	0.2	2		0.4		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	1		0.4	5.2	6.50
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.8	5.6	5.90
	Separability	0.1	2		0.2		
	Combustibility	0.5	4		2.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.7	6.55
	Material Density	0.2	6		1.2		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	6		1.2	4.2	4.20
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For Epoxy Coating

Material Number 56

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	2		1.0	1.0	5.50
	Market for Commodity	0.5	0		0.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	2		0.8	1.4	5.20
	Technical Operating Restrictions	0.6	1		0.6		
	Resource Depletion Potential	1.0		0	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	4.4	6.10
	Separability	0.2	2		0.4		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	[illegible].8	5.80
	Separability	0.2	2		0.4		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	1		0.4	5.2	6.50
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.8	5.8	5.90
	Separability	0.1	2		0.2		
	Combustibility	0.5	4		2.0		
	Potential Damage to Equipment	0.2	8		1.8		
	Air Pollution Potential	0.2		8	1.2	8.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.9	8.85
	Material Density	0.2	7		1.4		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		8	2.4		
Sea Disposal	Material Density	0.2	7		1.4	4.4	4.30
	Compactibility	0.3	8		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For Surlyn Wrapping

Material Number 57

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Sub-Total	Determined: Total Disposal Rating
Direct Reuse	Separability	0.5	5		2.5	4.5	7.25
	Market for Commodity	0.5	4		2.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	5		2.0	4.4	6.70
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	4.6	6.30
	Separability	0.2	5		1.0		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	8		1.6	4.2	6.00
	Separability	0.2	5		1.0		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	1		0.4	4.0	5.90
	Baleability	0.6	6		3.6		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	8		1.6	6.2	6.20
	Separability	0.1	5		0.5		
	Combustibility	0.5	5		2.5		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	8		0.8	5.8	6.60
	Material Density	0.2	5		1.0		
	Compactibility	0.4	7		2.8		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	5		1.0	4.3	4.25
	Compactibility	0.3	7		2.1		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For SURLYN CUSHIONING
Material Number 58

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	4		2.0	3.0	6.50
	Market for Commodity	0.5	2		1.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	4		1.6	4.0	6.50
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	4.6	6.20
	Separability	0.2	4		0.8		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	8		1.6	4.0	5.90
	Separability	0.2	4		0.8		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	8		3.2	6.8	7.30
	Baleability	0.6	6		3.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	8		1.6	6.1	6.15
	Separability	0.1	4		0.4		
	Combustibility	0.5	5		2.5		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	8		0.8	5.8	6.60
	Material Density	0.2	5		1.0		
	Compactibility	0.4	7		2.8		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	5		1.0	4.3	4.25
	Compactibility	0.3	7		2.1		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For Bakelite Tray

Material Number 59

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	5		2.5	4.5	7.25
	Market for Commodity	0.5	4		2.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	5		2.0	2.6	5.80
	Technical Operating Restrictions	0.6	1		0.6		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	4.8	6.30
	Separability	0.2	5		1.0		
	Chemical Degradability	0.4	4		1.8		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	8		1.6	4.2	6.00
	Separability	0.2	5		1.0		
	Biological Degradability	0.4	4		1.8		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	8		3.2	6.2	7.00
	Baleability	0.6	5		3.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	8		1.6	5.2	5.70
	Separability	0.1	5		0.5		
	Combustibility	0.5	3		1.5		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	8		0.8	6.4	6.90
	Material Density	0.2	8		1.6		
	Compactibility	0.4	7		2.8		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	8		1.6	4.9	4.55
	Compactibility	0.3	7		2.1		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For Polyolefin Wrapping

Material Number 60

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Sub-Total	Determined: Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.0	6.00
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	1.8	5.40
	Technical Operating Restrictions	0.6	1		0.6		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	4.6	6.20
	Separability	0.2	3		0.8		
	Chemical Degradability	0.4	4		1.8		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.0	5.90
	Separability	0.2	3		0.8		
	Biological Degradability	0.4	4		1.8		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Baling	Compactibility	0.4	1		0.4	5.2	8.50
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.8	5.2	5.70
	Separability	0.1	3		0.3		
	Combustibility	0.[illegible]	3		1.5		
	Potential Damage to Equipment	0.2	8		1.8		
	Air Pollution Potential	0.2		8	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.9	6.65
	Material Density	0.2	7		1.4		
	Compactibility	0.4	8		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	[illegible]	7		1.4	4.4	4.30
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For LUCITE CONTAINER

Material Number 61

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	5		2.5	4.5	7.25
	Market for Commodity	0.5	4		2.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	5		2.0	4.4	6.70
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	6		1.6	4.6	6.30
	Separability	0.2	5		1.0		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	8		1.6	4.2	6.00
	Separability	0.2	5		1.0		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	9		3.6	7.2	7.50
	Baleability	0.6	6		3.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	6		1.6	5.7	5.95
	Separability	0.1	5		0.5		
	Combustibility	0.5	4		2.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	8		0.6	6.0	6.70
	Material Density	0.2	6		1.2		
	Compactibility	0.4	7		2.6		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	6		1.2	4.5	4.35
	Compactibility	0.3	7		2.1		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.6		

Numerical Process Evaluation Matrix
For Nylon Sack

Material Number 62

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	3.0	6.50
	Market for Commodity	0.5	3		1.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	3.6	6.30
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	4.6	6.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.0	5.90
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	1		0.4	5.2	6.5
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.8	4.7	5.45
	Separability	0.1	3		0.3		
	Combustibility	0.5	2		1.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.9	6.65
	Material Density	0.2	7		1.4		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	7		1.4	4.4	4.30
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For NYLON CORD

Material Number 63

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Sub-Total	Determined: Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.0	6.00
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	3.6	6.30
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.6	4.6	6.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.0	5.90
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	1		0.4	5.2	6.50
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.8	4.7	5.45
	Separability	0.1	3		0.3		
	Combustibility	0.5	2		1.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.9	6.66
	Material Density	0.2	7		1.4		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	7		1.4	4.4	4.30
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For POLYCARBONATE WRAPPING

Material Number 64

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environ-mental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.0	6.00
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	3.6	6.30
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.6	4.6	6.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.6	4.0	5.90
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	1		0.4	5.2	6.50
	Baleability	0.6	8		4.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.6	6.7	6.45
	Separability	0.1	3		0.3		
	Combustibility	0.5	6		3.0		
	Potential Damage to Equipment	0.2	6		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.9	6.65
	Material Density	0.2	7		1.4		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	7		1.4	4.4	4.30
	Compactibility	0.3	6		1.6		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For POLYCARBONATE CONTAINER

Material Number 65

Process	Characteristics	Relative Importance	Determined Operational Rating	Determined Environmental Rating	Determined Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	5		2.5	4.5	7.25
	Market for Commodity	0.5	4		2.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	5		2.0	4.4	6.70
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	4.8	6.30
	Separability	0.2	5		1.0		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	8		1.6	4.2	6.00
	Separability	0.2	5		1.0		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	10		4.0	7.0	7.40
	Baleability	0.6	5		3.0		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	8		1.6	5.2	5.70
	Separability	0.1	5		0.5		
	Combustibility	0.5	3		1.5		
	Potential Damage to Equipment	0.2	6		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	8		0.8	6.2	6.80
	Material Density	0.2	7		1.4		
	Compactibility	0.4	7		2.8		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	7		1.4	4.7	4.45
	Compactibility	0.3	7		2.1		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For DACRON STRAP

Material Number 68

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.0	6.00
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	3.8	6.30
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	4.8	8.20
	Separability	0.2	3		0.8		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.0	5.90
	Separability	0.2	3		0.8		
	Biological Degradability	0.4	4		1.8		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Baling	Compactibility	0.4	1		0.4	5.2	8.50
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Incineration	Fragmentability	0.2	9		1.8	7.7	6.95
	Separability	0.1	3		0.3		
	Combustibility	0.5	8		4.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		8	1.2	8.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.8		
Sanitary Landfill	Fragmentability	0.1	9		0.9	6.3	6.85
	Material Density	0.2	9		1.8		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		8	2.4		
Sea Disposal	Material Density	0.2	9		1.8	4.8	4.50
	Compactibility	0.3	8		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For MYLAR POUCH

Material Number 67

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.0	6.00
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	3.6	6.30
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	4.6	6.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.0	5.90
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	1		0.4	5.2	6.50
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.8	7.7	6.95
	Separability	0.1	3		0.3		
	Combustibility	0.5	8		4.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	6.3	6.85
	Material Density	0.2	9		1.8		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	9		1.8	4.8	4.50
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For POLYETHYLENE WRAPPING

Material Number 68

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.0	6.00
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	3.6	6.30
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	4.6	6.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.0	5.90
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	2		0.8	5.0	6.40
	Baleability	0.6	7		4.2		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.8	6.7	6.45
	Separability	0.1	3		0.3		
	Combustibility	0.5	6		3.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.5	6.45
	Material Density	0.2	5		1.0		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	5		1.0	4.0	4.10
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For POLYETHYLENE CONTAINER

Material Number 69

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environ-mental Rating	Determined: Relative Rating	Determined: Sub-Total	Determined: Total Disposal Rating
Direct Reuse	Separability	0.5	5		2.5	4.5	7.25
	Market for Commodity	0.5	4		2.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	5		2.0	4.4	6.70
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	4.6	6.20
	Separability	0.2	5		1.0		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	8		1.6	4.2	6.00
	Separability	0.2	5		1.0		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	10		4.0	7.0	7.40
	Baleability	0.6	5		3.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	8		1.6	6.7	6.45
	Separability	0.1	5		0.5		
	Combustibility	0.5	6		3.0		
	Potential Damage to Equipment	0.3	6		1.8		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	5		0.6	5.6	6.50
	Material Density	0.2	5		1.0		
	Compactibility	0.4	7		2.8		
	Biological Degradability	0.2	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	5		1.0	4.2	4.25
	Compactibility	0.3	7		2.1		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For POLYPROPYLENE CORD

Material Number 70

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.0	6.00
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	3.6	6.30
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	4.6	6.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.0	5.90
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	1		0.4	5.2	6.50
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.8	6.7	6.45
	Separability	0.1	3		0.3		
	Combustibility	0.5	6		3.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.5	6.45
	Material Density	0.2	5		1.0		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sec. Disposal	Material Density	0.2	5		1.0	4.0	4.10
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For POLYPROPYLENE WRAPPING

Material Number 71

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.5	6.25
	Market for Commodity	0.5	2		1.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	3.6	6.30
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	4.6	6.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.0	5.90
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	[illegible].8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	2		0.8	5.6	6.70
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.8	6.7	6.45
	Separability	0.1	3		0.3		
	Combustibility	0.5	6		3.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.5	6.45
	Material Density	0.2	5		1.0		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	5		1.0	4.0	4.10
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For POLY PROPYLENE CUSHIONING

Material Number 72

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	4		2.0	3.0	6.50
	Market for Commodity	0.5	2		1.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	[illegible]		1.6	4.0	6.50
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	4.8	6.30
	Separability	0.2	4		0.8		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.2	6.00
	Separability	0.2	4		0.8		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	10		4.0	8.2	8.00
	Baleability	0.6	7		4.2		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.8	6.8	6.50
	Separability	0.1	4		0.4		
	Combustibility	0.5	6		3.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.5	6.45
	Material Density	0.2	5		1.0		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	5		1.0	4.0	4.10
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For POLY PROPYLENE CONTAINER

Material Number 73

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	5		2.5	4.5	7.25
	Market for Commodity	0.5	4		2.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	5		2.0	4.4	6.70
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	6		1.6	4.8	6.30
	Separability	0.2	5		1.0		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	6		1.6	4.2	6.00
	Separability	0.2	5		1.0		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	9		3.6	6.6	7.20
	Baleability	0.6	5		3.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	8		1.6	6.7	6.45
	Separability	0.1	5		0.5		
	Combustibility	0.5	6		3.0		
	Potential Damage to Equipment	0.2	6		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	6		0.6	5.8	6.60
	Material Density	0.2	5		1.0		
	Compactibility	0.4	7		2.6		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	5		1.0	4.3	4.25
	Compactibility	0.3	7		2.1		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.6		

Numerical Process Evaluation Matrix
For POLYSTYRENE WRAPPING

Material Number 74

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.0	6.00
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	3.6	6.30
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	4.6	6.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.0	5.90
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	2		0.8	5.6	6.70
	Baleability	0.6	6		4.8		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.6	6.7	6.45
	Separability	0.1	3		0.3		
	Combustibility	0.5	6		3.0		
	Potential Damage to Equipment	0.2	6		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.7	6.55
	Material Density	0.2	6		1.2		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	6		1.2	4.2	4.20
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For POLYSTYRENE CONTAINER

Material Number 75

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	5		2.5	4.5	7.25
	Market for Commodity	0.5	4		2.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	5		2.0	4.4	6.70
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	4.8	8.30
	Separability	0.2	5		1.0		
	Chemical Degradability	0.4	4		1.8		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	8		1.6	4.2	6.00
	Separability	0.2	5		1.0		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	8		3.2	6.2	7.00
	Baleability	0.6	5		3.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	8		1.8	8.7	6.45
	Separability	0.1	5		0.5		
	Combustibility	0.5	6		3.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		8	1.2	8.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.8		
Sanitary Landfill	Fragmentability	0.1	8		0.8	8.0	6.70
	Material Density	0.2	6		1.2		
	Compactibility	0.4	7		2.8		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	6		1.2	4.5	4.35
	Compactibility	0.3	7		2.1		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For STYROFOAM CONTAINER

Material Number 76

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Sub-Total	Determined: Total Disposal Rating
Direct Reuse	Separability	0.5	5		2.5	4.5	7.25
	Market for Commodity	0.5	4		2.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	5		2.0	4.4	6.70
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	4.8	6.30
	Separability	0.2	5		1.0		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	8		1.6	4.2	6.00
	Separability	0.2	5		1.0		
	Biological Degradability	[illegible]	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	10		4.0	6.4	7.10
	Baleability	0.6	4		2.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	8		1.6	5.2	5.70
	Separability	0.1	5		0.5		
	Combustibility	0.5	3		1.5		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	[illegible]		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	8		0.8	6.0	6.70
	Material Density	0.2	6		1.2		
	Compactibility	0.4	7		2.8		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	6		1.2	4.5	4.35
	Compactibility	0.3	7		2.1		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For STYROFOAM CUSHIONING

Material Number 77

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	4		2.0	3.0	6.50
	Market for Commodity	0.5	2		1.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	4		1.6	4.0	6.50
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.6	4.8	6.30
	Separability	0.2	4		0.6		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.2	6.00
	Separability	0.2	4		0.8		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	10		4.0	6.4	7.10
	Baleability	0.6	4		2.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.8	5.3	5.75
	Separability	0.1	4		0.4		
	Combustibility	0.5	3		1.5		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.7	6.55
	Material Density	0.2	6		1.2		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	6		1.2	4.2	4.20
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For STYROFOAM DUNNAGE

Material Number 78

Process	Characteristic	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.0	6.00
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	3.6	6.30
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	4.6	6.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.6	4.0	5.90
	Separability	0.2	3		0.8		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Baling	Compactibility	0.4	10		4.0	6.4	7.10
	Baleability	0.6	4		2.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.6	5.2	5.70
	Separability	0.1	3		0.3		
	Combustibility	0.5	3		1.5		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.7	6.55
	Material Density	0.2	6		1.2		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	6		1.2	4.2	4.20
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For POLYSULPHONE TRAY

Material Number 79

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environ-mental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	5		2.5	4.5	7.25
	Market for Commodity	0.5	4		2.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	5		2.0	4.4	6.70
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	4.6	6.30
	Separability	0.2	5		1.0		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	8		1.6	4.2	6.00
	Separability	0.2	5		1.0		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	10		4.0	7.0	7.40
	Baleability	0.6	5		3.0		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	8		1.6	5.2	5.70
	Separability	0.1	5		0.5		
	Combustibility	0.5	3		1.5		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	6		0.6	6.0	6.70
	Material Density	0.2	6		1.2		
	Compactibility	0.4	7		2.8		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	6		1.2	4.5	4.35
	Compactibility	0.3	7		2.1		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For TEFLON WRAPPING

Material Number 60

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.0	6.00
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	3.6	6.30
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	4.6	6.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.6	4.0	5.90
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	3.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	2		0.6	5.8	6.70
	Baleability	0.6	6		4.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.8	4.7	5.45
	Separability	0.1	3		0.3		
	Combustibility	0.5	2		1.0		
	Potential Damage to Equipment	0.2	6		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	6.3	6.85
	Material Density	0.2	9		1.6		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	9		1.6	4.8	4.50
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For TEFLON CONTAINER

Material Number 61

Process	Characteristic	Relative Importance	Determined				
			Operational Rating	Environ-mental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	5		2.5	4.5	7.25
	Market for Commodity	0.5	4		2.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	5		2.0	4.4	6.70
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	4.8	6.30
	Separability	0.2	5		1.0		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Compost-ing	Fragmentability	0.2	8		1.6	4.2	6.00
	Separability	0.2	5		1.0		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	7		2.8	5.2	6.50
	Baleability	0.6	4		2.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incinera-tion	Fragmentability	0.2	6		1.6	4.7	6.45
	Separability	0.1	5		0.5		
	Combustibility	0.5	2		1.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	8.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	6		0.6	6.6	7.00
	Material Density	0.2	9		1.8		
	Compactibility	0.4	7		2.8		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	9		1.8	5.1	4.65
	Compactibility	0.3	7		2.1		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For POLYURETHANE WRAPPING

Material Number 82

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	4		2.0	2.5	6.25
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	4		1.6	4.0	6.50
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	4.8	6.30
	Separability	0.2	4		0.6		
	Chemical Degradability	0.4	4		1.8		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.2	6.00
	Separability	0.2	4		0.8		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Baling	Compactibility	0.4	2		0.8	5.6	6.70
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Incineration	Fragmentability	0.2	9		1.8	5.3	5.75
	Separability	0.1	4		0.4		
	Combustibility	0.5	3		1.5		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.7	6.55
	Material Density	0.2	6		1.2		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	6		1.2	4.2	4.20
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.2	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For POLYURETHANE CUSHIONING

Material Number 63

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.5	6.25
	Market for Commodity	0.5	2		1.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	3.6	6.30
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	4.6	6.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.0	5.90
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	8		3.2	7.4	7.60
	Baleability	0.6	7		4.2		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.8	5.7	5.95
	Separability	0.1	3		0.3		
	Combustibility	0.5	4		2.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.7	6.55
	Material Density	0.2	6		1.2		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	6		1.2	4.2	4.20
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For POLYURETHANE CONTAINER

Material Number 84

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	5		2.5	4.5	7.25
	Market for Commodity	0.5	4		2.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	5		2.0	4.4	6.70
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	6		1.6	4.8	6.30
	Separability	0.2	5		1.0		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	8		1.6	4.2	6.00
	Separability	0.2	5		1.0		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	10		4.0	7.0	7.40
	Baleability	0.6	5		3.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	8		1.6	5.7	5.95
	Separability	0.1	5		0.5		
	Combustibility	0.5	4		2.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	6		0.6	6.2	6.60
	Material Density	0.2	7		1.4		
	Compactibility	0.4	7		2.8		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	7		1.4	4.7	4.45
	Compactibility	0.3	7		2.1		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For PVA WRAPPING

Material Number 85

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environ-mental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.0	6.00
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	3.6	6.30
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	4.8	8.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.0	5.90
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Baling	Compactibility	0.4	3		1.2	6.0	6.90
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.8	6.7	6.45
	Separability	0.1	3		0.3		
	Combustibility	0.5	6		3.0		
	Potential Damage to Equipment	0.2	8		1.8		
	Air Pollution Potential	0.2		8	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.8		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.9	6.65
	Material Density	0.2	7		1.4		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	7		1.4	4.4	4.30
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For PVAC WRAPPING

Material Number 86

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.0	6.00
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	3.6	6.30
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	4.6	6.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.0	5.90
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	3		1.2	6.0	6.90
	Baleability	0.6	6		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.8	5.2	5.70
	Separability	0.1	3		0.3		
	Combustibility	0.5	3		1.5		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.7	6.55
	Material Density	0.2	6		1.2		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	6		1.2	4.2	4.20
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For PVC WRAPPING

Material Number 67

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.0	6.00
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	3.6	6.30
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.6	4.6	6.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.6	4.0	5.90
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	3		1.2	6.0	6.90
	Baleability	0.6	8		4.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.6	5.7	5.95
	Separability	0.1	3		0.3		
	Combustibility	0.5	4		2.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	6.1	6.75
	Material Density	0.2	6		1.6		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	6		1.6	4.6	4.40
	Compactibility	0.3	6		1.6		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For PVC CONTAINER

Material Number 66

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	5		2.5	4.5	7.25
	Market for Commodity	0.5	4		2.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	5		2.0	4.4	6.70
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	4.6	6.30
	Separability	0.2	5		1.0		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	8		1.6	4.2	6.00
	Separability	0.2	5		1.0		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	2		0.8	5.6	6.70
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	8		1.6	5.7	5.95
	Separability	0.1	5		0.5		
	Combustibility	0.5	4		2.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	8		0.8	6.4	6.90
	Material Density	0.2	8		1.6		
	Compactibility	0.4	7		2.8		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	8		1.6	4.9	4.55
	Compactibility	0.3	7		2.1		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For SARAN WRAPPING

Material Number 89

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	3.5	6.75
	Market for Commodity	0.5	4		2.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	3.6	6.30
	Technical Operating Restrictions	0.6	4		2.4		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.6	4.6	6.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.0	5.90
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	1		0.4	5.2	6.50
	Baleability	0.6	6		4.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.6	5.2	5.70
	Separability	0.1	3		0.3		
	Combustibility	0.5	3		1.5		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	6.3	6.85
	Material Density	0.2	9		1.8		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	9		1.8	4.8	4.50
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.6		

Numerical Process Evaluation Matrix
For LATEX CUSHIONING

Material Number 90

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Sub-Total	Determined: Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.0	6.00
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	1.8	5.40
	Technical Operating Restrictions	0.6	1		0.8		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	4.6	8.20
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.[illegible]	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.0	5.[illegible]0
	Separability	0.2	3		0.8		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Baling	Compactibility	0.4	2		0.8	5.6	8.70
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.8	8.7	6.45
	Separability	0.1	3		0.3		
	Combustibility	0.5	6		3.0		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		8	1.2	8.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.8		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.5	8.45
	Material Density	0.2	5		1.0		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	5		1.0	4.0	4.10
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For RUBBERIZED HAIR

Material Number 91

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	2		1.0	1.5	5.75
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	2		0.8	1.4	5.20
	Technical Operating Restrictions	0.6	1		0.6		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	10		2.0	4.2	6.00
	Separability	0.2	2		0.4		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	1		0.2		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	3.8	5.80
	Separability	0.2	2		0.4		
	Biological Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	4		1.6	6.4	7.10
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	9		1.8	6.1	6.15
	Separability	0.1	2		0.2		
	Combustibility	0.5	5		2.5		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.9	6.65
	Material Density	0.2	7		1.4		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	5		1.0	4.0	4.10
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For CANVASS, RUBBERIZED

Material Number 92

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	6		3.0	8.0	9.00
	Market for Commodity	0.5	10		5.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	6		2.4	3.0	6.00
	Technical Operating Restrictions	0.6	1		0.6		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	6		1.2	3.6	5.70
	Separability	0.2	6		1.2		
	Chemical Degradability	0.4	2		0.8		
	Technical Operating Restrictions	0.2	2		0.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	6		1.2	3.6	5.70
	Separability	0.2	6		1.2		
	Biological Degradability	0.4	3		1.2		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	6		2.4	7.8	7.80
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	6		1.2	5.9	6.05
	Separability	0.1	6		0.6		
	Combustibility	0.5	5		2.5		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		6	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	6		0.6	6.4	6.90
	Material Density	0.2	8		1.6		
	Compactibility	0.4	9		3.6		
	Biological Degradability	0.3	2		0.6		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	8		1.6	4.9	4.55
	Compactibility	0.3	9		2.7		
	Biological Degradability	0.3	2		0.6		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For COTTON CUSHIONING

Material Number 93

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environ-mental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.5	6.25
	Market for Commodity	0.5	2		1.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	4.6	6.90
	Technical Operating Restrictions	0.6	6		3.6		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	10		2.0	7.6	7.70
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	10		4.0		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Compost-ing	Fragmentability	0.2	10		2.0	6.4	7.10
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	8		3.2		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	2		0.8	6.2	7.00
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incinera-tion	Fragmentability	0.2	10		2.0	9.3	7.85
	Separability	0.1	3		0.3		
	Combustibility	0.5	10		5.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	10		1.0	9.4	8.30
	Material Density	0.2	10		2.0		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	8		2.4		
	Air Pollution Potential	0.2		10	2.0	7.2	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	10		2.0	7.4	5.80
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	8		2.4		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For COTTON RAG
Material Number 94

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	4.0	7.00
	Market for Commodity	0.5	5		2.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	4.8	6.90
	Technical Operating Restrictions	0.6	8		3.6		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	6.8	7.30
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	9		3.6		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Composting	Fragmentability	0.2	8		1.6	6.0	8.90
	Separability	0.2	3		0.8		
	Biological Degradability	0.4	8		3.2		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	2		0.8	6.2	7.00
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	8		1.8	8.9	7.85
	Separability	0.1	3		0.3		
	Combustibility	0.5	10		5.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.8		
Sanitary Landfill	Fragmentability	0.1	8		0.8	9.2	8.20
	Material Density	0.2	10		2.0		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	8		2.4		
	Air Pollution Potential	0.2		10	2.0	7.2	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	10		2.0	7.4	5.80
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	8		2.4		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For COTTON SACK

Material Number 95

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environ-mental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	8.5	8.25
	Market for Commodity	0.5	10		5.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	4.8	6.90
	Technical Operating Restrictions	0.6	6		3.6		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	6.8	7.30
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	9		3.6		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	[illegible]		1.6	8.0	8.90
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	8		3.2		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	2		0.8	6.2	7.00
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	8		1.6	8.9	7.65
	Separability	0.1	3		0.3		
	Combustibility	0.5	10		5.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	8		0.8	9.2	8.20
	Material Density	0.2	10		2.0		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	8		2.4		
	Air Pollution Potential	0.2		10	2.0	7.2	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	10		2.0	7.4	5.80
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	8		2.4		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For FELT CUSHIONING

Material Number 96

Process	Characteristics	Relative Importance	Determined Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.5	6.25
	Market for Commodity	0.5	2		1.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	4.8	6.90
	Technical Operating Restrictions	0.6	6		3.6		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	10		2.0	7.6	7.70
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	10		4.0		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	10		2.0	6.4	7.10
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	8		3.2		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	1		0.4	5.8	6.80
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	10		2.0	9.3	7.85
	Separability	0.1	3		0.3		
	Combustibility	0.5	10		5.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	10		1.0	9.4	8.30
	Material Density	0.2	10		2.0		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	8		2.4		
	Air Pollution Potential	0.2		10	2.0	7.2	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	10		2.0	7.4	5.80
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	8		2.4		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	[illegible].2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For BURLAP SACK

Material Number 97

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Sub-Total	Determined: Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	6.5	8.25
	Market for Commodity	0.5	10		5.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	4.8	6.90
	Technical Operating Restrictions	0.6	6		3.6		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	8		1.6	6.8	7.30
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	9		3.6		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	8		1.6	6.0	6.90
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	8		3.2		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	2		0.8	6.2	7.00
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	8		1.6	8.9	7.65
	Separability	0.1	3		0.3		
	Combustibility	0.5	10		5.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	8		0.8	8.8	8.00
	Material Density	0.2	8		1.6		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	8		2.4		
	Air Pollution Potential	0.2		10	2.0	7.2	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	8		1.6	7.0	5.60
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	8		2.4		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For POLYOLEFIN/ALUMINUM/SCRIM

Material Number 98

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Sub-Total	Determined: Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	2.0	8.00
	Market for Commodity	0.5	1		0.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	1.8	5.40
	Technical Operating Restrictions	0.6	[illegible]		0.6		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	9		1.8	4.6	6.20
	Separability	0.2	3		0.8		
	Chemical Degradability	0.4	4		1.6		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	9		1.8	4.0	5.90
	Separability	0.2	3		0.8		
	Biological Degradability	0.4	4		1.8		
	Technical Operating Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Baling	Compactibility	0.4	1		0.4	5.2	6.50
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	[illegible]	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Incineration	Fragmentability	0.2	9		1.8	5.2	5.70
	Separability	0.1	3		0.3		
	Combustibility	0.5	3		1.5		
	Potential Damage to Equipment	0.2	8		1.6		
	Air Pollution Potential	0.2		8	1.2	6.2	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	9		0.9	5.[illegible]	8.85
	Material Density	0.2	7		1.4		
	Compactibility	0.4	8		2.4		
	Biological Degradability	0.3	4		1.2		
	Air Pollution Potential	0.2		10	2.0	7.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	7		1.4	4.4	4.30
	Compactibility	0.3	8		1.8		
	Biological Degradability	0.3	4		1.2		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For COOPERAGE KEG

Material Number 99

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	8		4.0	9.0	9.50
	Market for Commodity	0.5	10		5.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	8		3.2	4.4	8.70
	Technical Operating Restrictions	0.6	2		1.2		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	5		1.0	7.8	7.70
	Separability	0.2	8		1.6		
	Chemical Degradability	0.4	10		4.0		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	5		1.0	6.0	8.90
	Separability	0.2	8		1.6		
	Biological Degradability	0.4	7		2.8		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		8	2.4		
Baling	Compactibility	0.4	4		1.6	5.8	8.80
	Baleability	0.6	7		4.2		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	5		1.0	7.8	7.10
	Separability	0.1	8		0.8		
	Combustibility	0.5	8		4.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	8.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	5		0.5	5.0	8.10
	Material Density	0.2	2		0.4		
	Compactibility	0.4	5		2.0		
	Biological Degradability	0.3	7		2.1		
	Air Pollution Potential	0.2		10	2.0	7.2	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	2		0.4	4.0	4.10
	Compactibility	0.3	5		1.5		
	Biological Degradability	0.3	7		2.1		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For EXCELSIOR DUNNAGE

Material Number 100

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Sub-Total	Determined: Total Disposal Rating
Direct Reuse	Separability	0.5	3		1.5	3.0	6.50
	Market for Commodity	0.5	3		1.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	3		1.2	2.4	5.70
	Technical Operating Restrictions	0.6	2		1.2		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	10		2.0	7.6	7.70
	Separability	0.2	3		0.6		
	Chemical Degradability	0.4	10		4.0		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	10		2.0	6.0	6.90
	Separability	0.2	3		0.6		
	Biological Degradability	0.4	7		2.8		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	3		1.2	6.6	7.20
	Baleability	0.6	9		5.4		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	10		2.0	8.8	7.60
	Separability	0.1	3		0.3		
	Combustibility	0.5	9		4.5		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	10		1.0	7.5	7.35
	Material Density	0.2	2		0.4		
	Compactibility	0.4	10		4.0		
	Biological Degradability	0.3	7		2.1		
	Air Pollution Potential	0.2		10	2.0	7.2	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	2		0.4	5.5	4.85
	Compactibility	0.3	10		3.0		
	Biological Degradability	0.3	7		2.1		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For PLYWOOD CRATE

Material Number 101

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	7		3.5	8.5	9.30
	Market for Commodity	0.5	10		5.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	7		2.8	4.0	6.50
	Technical Operating Restrictions	0.6	2		1.2		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	6		1.2	7.6	7.70
	Separability	0.2	7		1.4		
	Chemical Degradability	0.4	10		4.0		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	6		1.2	6.0	6.90
	Separability	0.2	7		1.4		
	Biological Degradability	0.4	7		2.8		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	4		1.6	6.4	7.10
	Baleability	0.6	8		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	6		1.2	7.9	7.15
	Separability	0.1	7		0.7		
	Combustibility	0.5	8		4.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	6		0.6	6.7	6.95
	Material Density	0.2	2		0.4		
	Compactibility	0.4	9		3.6		
	Biological Degradability	0.3	7		2.1		
	Air Pollution Potential	0.2		10	2.0	7.2	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	2		0.4	5.2	4.70
	Compactibility	0.3	9		2.7		
	Biological Degradability	0.3	7		2.1		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For VENEER CRATE

Material Number 102

Process	Characteristics	Relative Importance	Determined: Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	7		3.5	8.0	9.00
	Market for Commodity	0.5	9		4.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	7		2.6	4.0	6.50
	Technical Operating Restrictions	0.6	2		1.2		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	6		1.6	8.0	7.90
	Separability	0.2	7		1.4		
	Chemical Degradability	0.4	10		4.0		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	8		1.6	6.6	7.30
	Separability	0.2	7		1.4		
	Biological Degradability	0.4	8		3.2		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.6	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	4		1.6	5.4	6.60
	Baleability	0.6	6		4.8		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	6		1.6	8.3	7.35
	Separability	0.1	7		0.7		
	Combustibility	0.5	8		4.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	6		0.6	7.2	7.20
	Material Density	0.2	2		0.4		
	Compactibility	0.4	9		3.6		
	Biological Degradability	0.3	8		2.4		
	Air Pollution Potential	0.2		10	2.0	7.2	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	2		0.4	5.2	4.70
	Compactibility	0.3	9		2.7		
	Biological Degradability	0.3	7		2.1		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For WOOD PALLET

Material Number 103

Process	Characteristics	Relative Importance	Determined: Operational Rating	Determined: Environmental Rating	Determined: Relative Rating	Determined: Sub-Total	Determined: Total Disposal Rating
Direct Reuse	Separability	0.5	7		3.5	6.5	9.25
	Market for Commodity	0.5	10		5.0		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	7		2.8	4.0	8.50
	Technical Operating Restrictions	0.6	2		1.2		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	5		1.0	7.4	7.60
	Separability	0.2	7		1.4		
	Chemical Degradability	0.4	10		4.0		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	5		1.0	5.8	8.70
	Separability	0.2	7		1.4		
	Biological Degradability	0.4	7		2.8		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	4		1.6	5.8	6.80
	Baleability	0.6	7		4.2		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	5		1.0	7.7	7.05
	Separability	0.1	7		0.7		
	Combustibility	0.5	8		4.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	5		0.5	5.2	6.20
	Material Density	0.2	3		0.6		
	Compactibility	0.4	5		2.0		
	Biological Degradability	0.3	7		2.1		
	Air Pollution Potential	0.2		10	2.0	7.2	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	3		0.6	4.2	4.20
	Compactibility	0.3	5		1.5		
	Biological Degradability	0.3	7		2.1		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.8		

Numerical Process Evaluation Matrix
For WIREBOUND WOOD CRATE

Material Number 104

Process	Characteristics	Relative Importance	Determined				
			Operational Rating	Environmental Rating	Relative Rating	Sub-Total	Total Disposal Rating
Direct Reuse	Separability	0.5	7		3.5	6.0	9.00
	Market for Commodity	0.5	9		4.5		
	Resource Depletion Potential	1.0		10	10.0	10.0	
Recycle	Separability	0.4	7		2.8	4.0	6.50
	Technical Operating Restrictions	0.6	2		1.2		
	Resource Depletion Potential	1.0		9	9.0	9.0	
Pyrolysis	Fragmentability	0.2	2		0.4	6.4	7.10
	Separability	0.2	7		1.4		
	Chemical Degradability	0.4	9		3.6		
	Technical Operating Restrictions	0.2	5		1.0		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Composting	Fragmentability	0.2	2		0.4	5.2	[illegible] 50
	Separability	0.2	7		1.4		
	Biological Degradability	0.4	7		2.8		
	Technical Operating Restrictions	0.2	3		0.6		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Baling	Compactibility	0.4	5		2.0	6.2	7.00
	Baleability	0.6	7		4.2		
	Air Pollution Potential	0.2		10	2.0	7.8	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		6	2.4		
Incineration	Fragmentability	0.2	2		0.4	7.1	6.75
	Separability	0.1	7		0.7		
	Combustibility	0.5	8		4.0		
	Potential Damage to Equipment	0.2	10		2.0		
	Air Pollution Potential	0.2		7	1.4	6.4	
	Water Pollution Potential	0.2		10	2.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		4	1.6		
Sanitary Landfill	Fragmentability	0.1	2		0.2	5.3	6.25
	Material Density	0.2	3		0.6		
	Compactibility	0.4	6		2.4		
	Biological Degradability	0.3	7		2.1		
	Air Pollution Potential	0.2		10	2.0	7.2	
	Water Pollution Potential	0.2		9	1.8		
	Land Pollution Potential	0.2		5	1.0		
	Resource Depletion Potential	0.4		6	2.4		
Sea Disposal	Material Density	0.2	3		0.6	4.5	4.35
	Compactibility	0.3	6		1.8		
	Biological Degradability	0.3	7		2.1		
	Regulatory Operational Restrictions	0.2	0		0.0		
	Air Pollution Potential	0.2		10	2.0	4.2	
	Water Pollution Potential	0.2		0	0.0		
	Land Pollution Potential	0.2		7	1.4		
	Resource Depletion Potential	0.4		2	0.6		

APPENDIX D

ECONOMIC ANALYSIS OF WASTE DISPOSAL PROCESSES

1. COST AND REVENUE DATA

As mentioned in the Fact Sheet format section of this report, Chapter II, Section 4, the economics of waste disposal processes are a function of many variables, such as the tons of particular wastes generated per day and specific locations of the Army installations in reference to other available reclamation and disposal sites. Therefore, to make the Summary Fact Sheets as complete as possible, and prior to selecting a waste disposal process, it will be necessary for the cognizant officer at each Army installation to assess the economics associated with each alternative waste disposal process.

As an aid in determining the relevant costs and revenues of the alternative processes, a Cost Revenue Data Sheet, Table D-1, has been developed in conjunction with specific instructions for completing the table. An example of the Completed Cost Revenue Data Sheet, Table D-2, is provided. In addition, a Summary Cost Data Sheet for solid waste and liquid waste, Tables D-3 and D-4, respectively, and specific instructions for each, have been developed and are presented on the following pages.

(1) Cost/Revenue Data Sheet

The objective of the Cost/Revenue Data Sheet is to determine for each process, the daily costs and revenues involved in the disposal of solid or chemical wastes. The cognizant officer at each U.S. Army base will be tasked with the determination of (1) relevant costs and revenue figures and (2) the disposal cost per ton for each process.

General

U.S. Army Base Name: ____________ Material Category: ____________ Process: ____________

U.S. Army Base Location: ____________ Date: ____________

Process Data

Capital Costs
- Land $______
- Buildings $______
- Equipment $______

Total Capital Costs: $______

Economic Life
- Land ______ yr
- Plant ______ yr
- Equipment ______ yr

Interest Rate (%) ______ %

Capacity
- Design ______ tons/day
- Actual Throughput ______ tons/day

Installation Date ______

No. of Operating Days ______ /yr

No. of Operating Shifts ______ /yr

Cost/Revenue Data

Direct Costs

Operating Labor

Per Shift No. of Employees		Daily Wages		No. of Shifts		Subtotal
____	x	____	x	____	=	____
____	x	____	x	____	=	____
____	x	____	x	____	=	____
____	x	____	x	____	=	____

Daily Operating Labor Cost: $______/day

Maintenance Labor

Per Shift No. of Employees		Daily Wages		No. of Shifts		Subtotal
____	x	____	x	____	=	____
____	x	____	x	____	=	____
____	x	____	x	____	=	____
____	x	____	x	____	=	____

Daily Maintenance Labor Cost: $______/day

Ultimate Disposal Cost of Residue: $______/day

Daily Direct Costs: $______/day

Indirect Costs

Fringe Benefits

Benefit Rate ______ x Total O.&M. Labor Wages ______ $______/day

Utilities $______/day

Materials and Supplies $______/day

Overhead and Administrative Costs $______/day

Capital Amortization

	Capital Cost		Annual Amortization Factor		No. of Operating Days/Year		
Land	____	x	____	÷	____	=	____
Plant	____	x	____	÷	____	=	____
Equipment	____	x	____	÷	____	=	____

Daily Capital Amortization $______/day

Daily Indirect Costs: $______/day

Revenue

Sale of By-Products: $______/day

Sale of Salvage: $______/day

External Contractual Services Revenue: $______/day

Daily Revenue: $______/day

Disposal Costs

Disposal Cost (dollars per day)

Daily Direct Costs: $______/day

+ Daily Indirect Costs: $______/day

Daily Costs: $______/day

- Daily Revenue: $______/day

Daily Disposal Costs: $______/day

Actual Throughput (in tons): ______/day

Daily Disposal Costs per Ton: $______/ton/day

TABLE D-1. COST/REVENUE DATA SHEET

COST/REVENUE DATA SHEET

General

U.S. Army Base Name: Fort Hometown
U.S. Army Base Location: Hometown, Iowa
Material Category: Papers
Process: Incineration
Date: 12/1/73

Process Data

Capital Costs		Economic Life		Interest Rate (%)	Capacity		
Land	$ 15,000	Land	35 yr	4 %	Design	120	tons/day
Buildings	$ 550,000	Plant	35 yr		Actual Throughput	100	tons/day
Equipment	$125,000	Equipment	15 yr				
Total Capital Costs:	$ 690,000						

Installation Date 1/1/73
No. of Operating Days 260 /yr
No. of Operating Shifts 2 /yr

Cost/Revenue Data

Direct Costs

Operating Labor

Per Shift No. of Employees		Daily Wages		No. of Shifts		Subtotal
2	x	20	x	2	=	80
2	x	25	x	2	=	100
1	x	30	x	2	=	60
	x		x		=	

Daily Operating Labor Cost: $ 240 /day

Maintenance Labor

Per Shift No. of Employees		Daily Wages		No. of Shifts		Subtotal
1	x	30	x	2	=	60
	x		x		=	
	x		x		=	
	x		x		=	

Daily Maintenance Labor Cost: $ 60 /day
Ultimate Disposal Cost of Residue: $ 75 /day
Daily Direct Costs: $ 375 /day

Indirect Costs

Fringe Benefits

Benefit Rate		Total O.&M. Labor Wages		
.25	x	300	=	$ 75 /day

Utilities $ 130 /day
Materials and Supplies $ 20 /day
Overhead and Administrative Costs $ 70 /day

Capital Amortization

	Capital Cost		Annual Amortization Factor		No. of Operating Days/Year		
Land	15,000	x	.0534	÷	260	=	3.09
Plant	550,000	x	.0534	÷	260	=	113.34
Equipment	125,000	x	.0899	÷	260	=	43.24

Daily Capital Amortization $ 159.67 /day

Daily Indirect Costs: $ 454.67 /day

Revenue

Sale of By-Products: $ 148 /day
Sale of Salvage: $ 14 /day
External Contractual Services Revenue: $ 0 /day
Daily Revenue: $ 162 /day

Disposal Costs

Disposal Cost (dollars per day)

Daily Direct Costs: $ 375 /day
+ Daily Indirect Costs: $ 454.67/day
Daily Costs: $ 829.67 /day
- Daily Revenue: $ 162.00 /day
Daily Disposal Costs: $ 667.67 /day
Actual Throughput (in tons): 100 /day
Daily Disposal Costs per Ton: $ 6.67 /ton/day

TABLE D-2. SAMPLE OF COMPLETED COST/REVENUE DATA SHEET

For entering data on the Cost/Revenue Data Sheet, the following instructions apply.

General

U.S. Army Base Name:	Enter the name of your particular Army base.
U.S. Army Base Location:	Enter the location of your particular Army base.
Material Category:	Enter the name of the material category as it is stated on the Fact Sheet.
Process:	Enter the name of the disposal process that is under consideration.
Date:	Enter the date on which this data sheet is completed.

Process Data

Capital Costs:	Enter the one-time investment costs for the land, buildings, and associated equipment including any initial engineering, training, or legal costs. The total capital cost is the sum of these investments.
Economic Life:	Enter the economic or useful life in years for each capital cost investment. The data will be used for determining the amortization factor. (See Note on page D-7).
Interest Rate:	Enter, in terms of percent, the present interest rate or cost of money (e.g., 4%, 6%, 10%). The interest rate will be used for determining the amortization factor.

Capacity:	Enter the design or rated capacity of the disposal process in tons per day. Enter the actual or estimated throughput of the disposal process in tons per day.
Installation Date:	If the disposal process is presently operating, enter the date of installation. If the disposal process is not presently operating, enter the words, "Not Applicable."
Number of Operating Days:	Enter the number of days the process is or would operate per year.
Number of Operating Shifts:	Enter the number of shifts which is or would be operated per year.

Cost/Revenue Data

Direct Costs

Operating Labor:	Enter the number of employees per shift and their associated daily wages for each labor grade (e.g., \$30.00 per day). Multiply the number of employees per shift by their associated daily wages and by the number of shifts. Enter this product under the subtotal heading. Add the values under the subtotal heading and enter this sum in the daily operating labor cost space.

Maintenance Labor:	Enter the number of employees per shift and their associated daily wages for each labor grade (e.g., \$30.00 per day). Multiply the number of employees per shift by their associated wages and by the number of shifts. Enter this product under the subtotal heading. Add the values under the subtotal heading, and enter this sum in the daily maintenance labor cost space.
Ultimate Disposal Cost of Residue:	Enter the daily costs involved in collecting, transporting, and disposing of the residue from the process. If the ultimate disposal is sanitary landfill, the cost of disposing may be obtained from the Cost/Revenue Data Sheet for sanitary landfill.
Daily Direct Costs:	Enter the sum of the total daily operating and maintenance labor costs, and the ultimate disposal cost of the residue.

Indirect Costs

Fringe Benefits:	Enter the existing fringe benefit rate in decimal form (e.g., .25) in the provided space and the sum of the daily operating and maintenance (O&M) costs in the labor wages space. Multiply the benefit rates by the labor wages. Enter the product in the provided space.
Utilities:	Enter the cost of utilities per day.

Materials and Supplies:	Enter the cost of materials and supplies for the operation and maintenance of the process on a per-day basis.
Overhead and Administrative Cost:	Enter the daily overhead (not included in other indirect costs) and administration costs.
Capital Amortization:	Enter the capital costs for each investment (see process data section). Enter the annual amortization factor selected from standard interest rate tables on the basis of the economic life and the interest rate. Multiply the capital cost by its respective amortization factor. Since this value is an annual amount, divide this amount by the number of operating days per year. Add the capital amortization for the land, plant, and equipment. Enter the sum of the daily capital amortization in the space provided.
Daily Indirect Costs:	Enter the sum of the daily costs of fringe benefits, utilities, materials and supplies, overhead and administration, and capital amortization.

Revenue

Sale of By-Products:	Enter the daily amount of dollars received from the sale of by-products.
Sale of Salvage:	Enter the daily amount of dollars received from the sale of salvageable materials.

External Contractual Services/Revenue: Enter the daily amount of dollars received for external contractual services rendered.

Daily Revenue: Add the daily sales of by-products, salvage, and the external contractual services. Enter this sum in the space provided.

Disposal Costs

Daily Direct Costs: Enter the daily direct costs from above.

Daily Indirect Costs: Enter the daily indirect costs from above.

Daily Costs: Enter the sum of the daily direct and indirect costs.

Daily Revenue: Enter the daily revenue dollars from above.

Daily Disposal Cost: Subtract the daily revenue from the daily costs. Enter this value in the space provided.

Actual Throughput: Enter the actual daily throughput in tons per day from the process data section.

Daily Disposal Cost per Ton: Divide the daily disposal cost by the actual throughput. Enter the result in the space provided.

Note: For purposes of computing depreciation, land is usually excluded. However, in the computation of the amortization of the investment, the economic and useful life of the land is usually taken to be the same as the plant except for sanitary landfill. In such a case, the following calculations apply:

$$E = \frac{FR}{D}\left(1 \quad \frac{P}{100}\right) \qquad \text{(D. 1)}$$

where E = estimation of necessary landfill capacity in cubic yards per year

F = a factor incorporating cover material, averaging 17 percent for deep fills and 33 percent for shallow fills, with corresponding F values of 1.17 and 1.33

R = amount of wastes in pounds per year

D = average density of wastes in pounds per cubic yard

P = percent reduction of waste volume in the landfill (0 to 90 percent).

$$Y = \frac{A}{E} \qquad \text{(D. 2)}$$

where Y = number of useful years left in landfill site

A = present availability of the landfill site in cubic yards

E = estimation of necessary landfill capacity in cubic yards per year.

Example:

A hypothetical Army base, utilizing a deep fill sanitary landfill, generates 10,000,000 lb of wastes per year. The average density of the wastes is 300 lb/cu ft, and the estimated volume reduction is 17 percent. The present availability of land is 323,700 cu yd.

Solution:

$F = 1.17$

$R = 10,000,000$ lb/year

$D = 300$ lb/cu ft

$P = 17$ percent

$A = 323,700$ cu yd

Equation (D. 1):

$$E = \frac{FR}{D}\left(1 - \frac{P}{100}\right)$$

$$E = \left[\frac{(1.17)\,(10,000,000)}{300}\right] x \left[1 - \frac{17}{100}\right]$$

$$E = (39,000) \times (.83)$$

$$E = 32,370 \text{ cu yd/year}$$

Equation (D. 2):

$$Y = \frac{A}{E}$$

$$Y = \frac{323,700}{32,370} = 10 \text{ years}$$

(2) Summary Cost Data Sheet

The objective of the Summary Cost Data Sheets (Tables D-3, D-4) is to determine for each disposal process (1) the daily cost per ton and (2) the resultant economic ranking. The cognizant officer at each U.S. Army base will be tasked with the determination of the economic ranking of each disposal process.

For entering data on the Summary Cost Data Sheet, the following instructions apply.

U.S. Army Base Name:	Enter the name of your particular Army base.
Material Category:	Enter the material category as it is stated on the Fact Sheet
Date:	Enter the date on which this data sheet is completed.
Daily Disposal Cost per Ton:	Enter the daily disposal cost per ton for each enumerated process from the Cost/Revenue Data Sheet.
Daily Collection Cost per Ton:	Enter the daily collection cost per ton from the Cost/Revenue Data Sheet for each process. Unless unusual circumstances arise, the cost will be the same for each enumerated process.
Daily Cost per Ton:	Add the respective daily disposal cost per ton and the daily collection cost per ton. Enter the respective sum for each enumerated process in the space provided.

TABLE D-3

SUMMARY COST DATA SHEET — SOLID WASTE

U.S. Army Base Name: ________ Material Category: ________ Date: ________

Process	Reuse	Recycle	Compost	Pyrolysis	Compaction	Shredding	Incineration	Sanitary Landfill	Sea Disposal
Daily Disposal Cost per ton									
Daily Collection Cost per ton									
Daily Cost per ton									
Economic Ranking*									

*To be entered on the Solid Waste Summary Fact Sheet.

Note: It is not technically feasible to dispose of some materials by a given process. In this instance, the notation N.A. for "not applicable" should be entered. (For example, metals being disposed of by pyrolysis.)

TABLE D-4

SUMMARY COST DATA SHEET — CHEMICAL WASTE

U.S. Army Base Name:____________ Material Category:________________ Date:______

Process	Recovery and Reuse	Sanitary Landfill	Incineration	Sea Disposal	Microbial Treatment
Daily Disposal Cost per ton					
Daily Collection Cost per ton					
Daily Cost per ton					
Economic Ranking*					

*To be entered on the Liquid Waste Summary Fact Sheets.

Economic Ranking:

Review the computed daily cost per ton figures. Rank each process with the lowest daily cost per ton receiving a value of 1, the next lowest a value of 2 and so on until all processes are ranked. Enter the economic rankings on the Solid Waste Summary Fact Sheet or the Liquid Waste Summary Fact Sheet as applicable.

2. COST ESTIMATES

As an aid in accomplishing the economic analysis, cost estimates of different waste disposal processes have been extracted from Volume II of the Handbook of Environmental Control, and are presented on the following pages.

The cost estimates are grouped in the following manner:

- Common Waste Disposal Methods
- Refuse Collection
- Size Reduction Equipment
- Pyrolysis
- Composting
- Incineration
- Sanitary Landfill
- Liquid Waste Disposal
- Marine Disposal.

COSTS OF COMMON WASTE DISPOSAL METHODS

Method	Description	Direct cost A	Direct cost B	Status
Mechanical compaction	Compression of refuse to reduce its volume by a factor of 3–15		0.05–0.25	Used extensively to reduce collection and hauling costs
Burning and dumping in the open	Dumping and burning of refuse in the city dump	Minimal		Accounts for 45 per cent of waste disposal, but use is decreasing
Incineration	Burning of refuse in a furnace under controlled conditions	3,000–10,000[1] 3,500–7,000[2]	3–8[1] 3.5–5[2]	Fairly well accepted in large communities
Pyrolysis	Chemical conversion of organic fraction to useful products	5,000–10,000	3–10	Introduction contingent on salability of products
Composting	Conversion of organic fraction to harmless products by microbial activity	4,000–10,000[1] 1,500–10,000[2]	3–10[1] 2–7[2]	Introduction contingent on salability of products
Sanitary landfill	Burial of refuse or processed residue under 1–2 feet of soil	1,000–2,000[1,2]	1–2[1] 1.25–2.25	Accounts for 45 per cent of waste disposal, especially in communities with access to land expanses
Mine fill	Hauling of refuse to and burial in abandoned mines		4–6	Being introduced in large communities with access to abandoned mines
Ocean dumping	Dumping of refuse from barges in open ocean			Largely discontinued except for a few coastal cities
Hog feeding	Feeding of garbage to hogs	Not relevant		Largely discontinued as a consequence of sterilization requirement
Waste disposer	Grinding of garbage in sink unit and disposal in sewers	Not relevant		Fairly popular in communities with sewer systems
Salvage	Processing and reuse of waste	Highly variable		Ancient, with a growing impact

Note: A = capital investment (excluding cost of land), in $ per ton of rated daily capacity.
B = operating cost, in $ per ton of unprocessed refuse.

REFERENCES
1. A. Herstatt, "Solid Waste Treatment," *Science and Technology*, 90: 34, June 1969.
2. A. Spilhaus, *Waste Management and Control*, National Academy of Sciences, National Research Council, 1966.

UNIT COSTS OF COMMON WASTE DISPOSAL METHODS

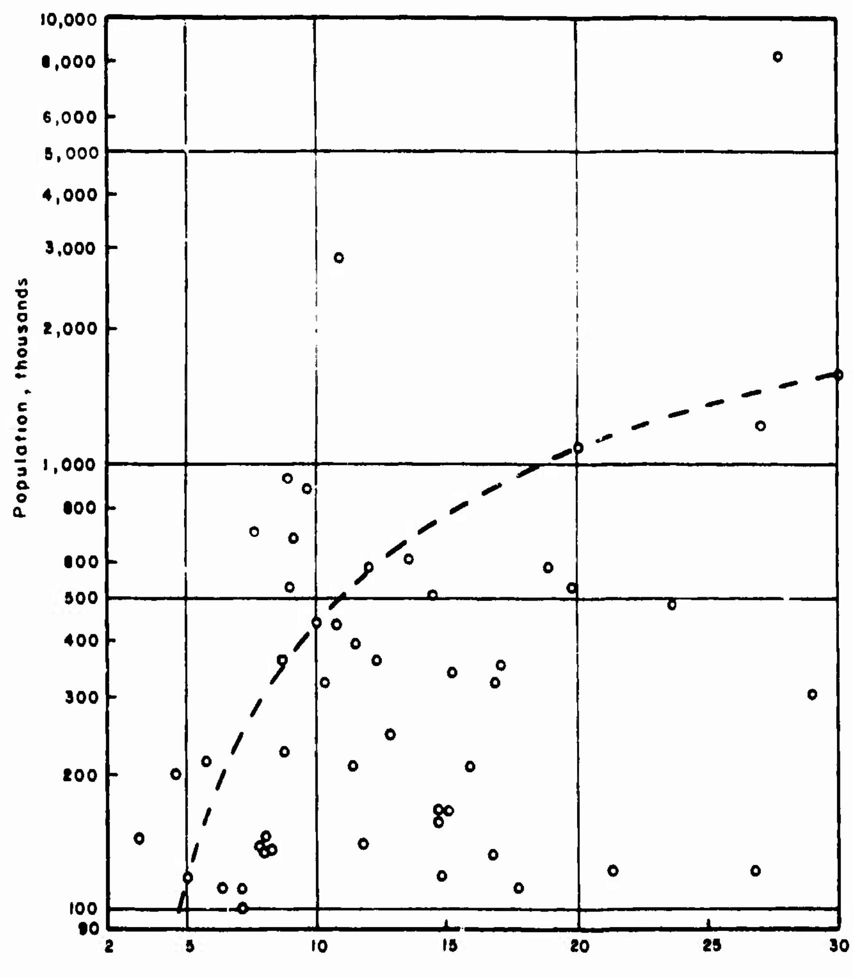
Candidate concept	Collections per week	Cost/ton, 1967
	Processing	
Central municipal incineration (standard)		$ 7.00
Central municipal incineration (with air pollution control)		9.00
Sludge incineration		24.00
Industrial incineration		16.00
Open burning		negligible
Composting (mechanical)		10.00
Composting (windrow)		5.00
Sewage treatment		3.00
Single residence refuse grinders		28.00
Central refuse grinders		3.00
Central compression and baling		4.50
	Disposal	
Sanitary landfilling		1.20
Open dumping		0.50
Land spreading		1.00
Animal feeding		0.17

Source: *A Systems Study of Solid Waste Management in the Fresno Area*, U.S. Department of Health, Education, and Welfare, Public Health Service, 1969

COST OF REFUSE COLLECTION

The cost of refuse collection varies from $5 to $25 per ton, depending on route structure, number of required stops, and location of containers. Since this item represents 70 to 80 per cent of the total refuse-handling budget, simplification of collection procedure can yield considerable savings. Conversely, a cumbersome collection problem can lead to dramatic consequences. For example, the average cost of disposing of an item discarded along the highway has been estimated at 32 cents!

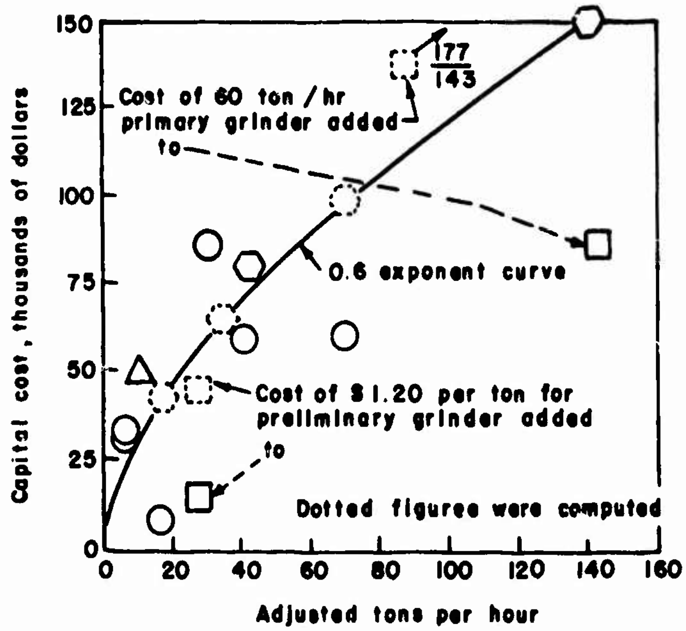
Source: A. Hershaft, "*Solid Waste Treatment*," *Sci. Technol.*, 90:36, June 1969.



3.2 48 Cost of Refuse Collection in 46 Cities.

Source: ***A Study of Solid Waste Collection Systems Comparing 1-Man with Multi-Man Crews***
U.S. Department of Health, Education, and Welfare, Public Health Service, 1969, p. 62.

COST OF SIZE REDUCTION EQUIPMENT



3.2-148 Capital Cost of Size Reduction Equipment.

Source: R.F. Testin and N. L. Drobny, "Processing and Recovery of Municipal Solid Waste," *J. Sanit. Eng. Div.*, Proc. Am. Soc. Civ. Eng., June 1970, p. 706.

COST OF SIZE REDUCTION EQUIPMENT

	Grate Size		
Cost	55 mm - 2 in.	100 mm - 4 in.	150 mm - 6 in.
Labor	$2.42	$2.04	$1.50
Depreciation	3.17	2.86	2.04
Hammer wear	0.26	0.23	0.16
Utility	0.76	0.56	0.58

Source: *Solid Waste Reduction Salvage Plant*, U.S. Department of Health, Education, and Welfare, Public Health Service, 1968, p. 14.

COST ESTIMATE FOR PYROLYSIS

Plant cost	**$6,000,000**
Fixed charges at 0.1030[a]	824,000
Labor, 12 men at $7,000	84,000
4 men at $9,000	36,000
Maintenance (2% retort investment)[b]	190,000
Disposal 149T residual refuse/day at $4.50/ton	245,000
Total cost	1,065,000
Revenue at $1,521/day	550,000
Net annual cost	515,000
Disposal cost/ton	$5.66

[a] Original paper assured 20-year plant life at 4 per cent interest. These figures were changed to 15 years and 6 per cent, respectively.

[b] Data obtained on hammermill operation indicated maintenance costs of the order of $1.00/ton processed could be expected. Approximately $90,000 was, therefore, added to Porteous' maintenance figure.

Source: A. Porteous, "Toward a Profitable Means of Waste Disposal," presented at Winter Annual Meeting and Energy Systems Exposition, Am. Soc. Mech. Eng., November 1967.

REFERENCES

1. G.R. Fryling, *Combustion Engineering*, Combustion Engineering, Inc., 1966, p. 3.
2. W.G. Nelson, "Wood Utilization by the Badger-Stafford Process," *Ind. Eng. Chem.*, 22(4):312, April 1930.

3.2 410 REVENUE ESTIMATE FOR PYROLYSIS

Item	Yield, per cent	Ton/day	Price	Revenue, per diem
Acetone	0.3	0.45	6.5¢/lb	$57
Acetic acid	3.1	4.65	9¢/lb	835
Tars	7	10.5		
Oils	5	7.5	1¢/lb	360
Charcoal	25	37.5	$7/ton	260
				$1,512

Source: A. Porteous, "Toward a Profitable Means of Waste Disposal," presented at Winter Annual Meeting and Energy Systems Exposition, Am. Soc. Mech. Eng., November 1967.

TYPICAL LOW PRESSURE PYROLYSIS SYSTEMS

System	U.S. Bureau of Mines, Pittsburgh, Pa.[1,2] (Domestic refuse and industrial waste)	Monsanto Enviro-Chem[3]	Pan American Resources[4]	University of California[5]
Reactor type	3.8 ft³/batch, electrically heated	Rotary kiln, 35 ton/day pilot plant	Rotary kiln, 45 ton/day industrial waste treatment plant	Two-stage pilot plant I Fluidized bed II
Temperature, °C	500–900		500–800	I 500–700 II 850–1,200
Products, per ton of refuse				
Gas	7,400–18,000 ft³ 332–579 Btu/ft³ 3.7–9.2 million Btu/ton refuse		25 ft³ of gas per foot of waste (gas figure includes uncondensed oils, tars plus aqueous liquor), 400–500 Btu/ft³	
Oil	0.6–3.7 gal			Applicable to treatment of paper mill black liquor to recover inorganic pulping chemicals
Tar	0.5–5.6 gal 10,000–18,000 Btu/lb			
Char	150–830 lb, 2,200–8,700 Btu/lb		600–700 lb; 12,000 Btu/lb	
Aqueous liquor	20–130 gal			
Other	16–32 lb ammonium sulfate			
Cost	$2–6 per ton net cost (includes credit for products)[1]	$7.50–8.50 per ton (no reclamation of products)	$3.50–4.00 per ton	–

REFERENCES

1. "Reuse and Recycle of Wastes," Proc. Northeastern Regional Antipollution Conference, University of Rhode Island, 1971.
2. W.S. Sanner *et al.*, *Conversion of Municipal and Industrial Refuse Into Useful Materials by Pyrolysis*, U.S. Department of the Interior, Bureau of Mines, 1970.
3. "Pyrolysis of Refuse Gains Ground," *Environ. Sci. Technol.*, 5:310, 1971.
4. C.G. Golueke, *Solid Waste Management*, University of California, 1970.
5. C.G. Golueke and P.H. McGauhey, *Comprehensive Studies of Solid Waste Management*, University of California, 1970.

ACTUAL COST OF OPERATIONS FOR THE USPHS-TVA COMPOSTING PLANT, 1968[a]

7,164 Tons Processed in 210 Days

Activities	Operations								Maintenance						Grand total
	Salaries and benefits	Super-vision	Electric power	Utilities (excluding electricity)	Truck use	Supplies and materials	Miscel-laneous	Total	Salaries and benefits	Super-vision	Supplies and materials	Repairs	Miscel-laneous	Total	
Receiving[a]	$6,905	$1,181	$59			$28		$8,173	$974	$250	$661	$480		$2,365	$10,538
Picking and sorting	8,116	1,388	17			319		9,840	305	78	30			413	10,253
Disposal of rejects[b]	7,351	1,258			$3,524	38		12,171	620	159	56			835	13,006
Grinding															
Rasper	3,211	549	770					4,530	2,134	548	2,925			5,607	10,137
Hammermill	39	7	17					63	231	59				290	353
Composting															
Hauling and handling	5,930	1,015	28		5,764	327	$50	13,114	3,073	789	677	140		4,679	17,793
Turning and wetting	4,615	790				291	21	5,717	2,342	600	1,548	783		5,273	10,990
Curing	982	168			224	9		1,383	45	12		15		72	1,455
Storage	2,477	424			577		48	3,526							3,526
Operation and maintenance															
Grounds, buildings, and utilities			1,165					1,165	4,506	1,156	509		$68	6,239	7,404
Cleanup of process and receiving buildings	9,556	1,635				123		11,314							11,314
Office and laboratory	6,123	1,048	378	$614		800	144	9,107							9,107
Other	1,712	293		134	1,044	4,519	624	8,326							8,326
Regrinding and screening	4,293	734	130		1,230			6,387	846	217			409	1,472	7,859
Sewage sludge processing	3,350	573	54			782		4,759	2,970	762	1,395	218		5,345	10,104
Total	64,660	11,063	2,618	748	12,363	7,236	887	99,575	18,046	4,630	7,801	1,636	477	32,590	132,165

[a] At plant site.
[b] Includes cost of haulage to landfill (no landfilling costs).

Source: A. W. Breidenbach *et al., Composting of Municipal Solid Wastes in the United States*, U.S. Environmental Protection Agency, 1971, p. 66.

COSTS OF PROCESSING RAW REFUSE UTILIZING DIFFERENT COMPOST SYSTEMS

$/U.S. Ton

Type of system	Dano[a]	Dorr-Oliver[b]	Ventilated cells[c]	Buhler-Dano[d]	Van Maanen[e]	Average, unweighted
Number of plants	5	3	3	2	1	14
Capital cost						
Amortization of building and equipment	0.78	0.68	1.08	2.01	0.19	0.95
Interest on building and equipment	0.74	0.55	0.65	1.18	0.12	0.64
Interest on reserve fund	0.08	0.07	0.05	0.06	0.03	0.06
Rental of land	0.04	0.15	0.0[illegible]	0.04	0.21	0.11
	1.64	1.45	1.86	3.29	0.55	1.76
Operating expense						
Personnel	1.08	0.83	1.92	1.74	0.64	1.23
Utilities	0.38	0.29	0.53	0.50	0.07	0.36
Maintenance and repairs	0.33	0.64	0.25	0.73	0.46	0.49
Disposal of rejects	0.30	0.20	0.20	0.12	0.05	0.17
Miscellaneous	0.36	0.31	0.37	0.18	1.46	0.54
	2.45	2.27	3.27	3.27	2.68	2.79
Total cost	4.09	3.72	5.13	6.56	3.23	4.55
Income						
Salvage	0.42	0.08	0.17	0.02	0.13	0.16
Sale of compost	1.18	1.15	1.56	0.70	0.45	1.01
Total income	1.60	1.23	1.73	0.72	0.58	1.17
Net cost	2.49	2.49	3.40	5.84	2.65	3.38
Cost indices						
Interest rate, %	7.5	7.5	5.3	4.7	5.0	6.5
Typical labor cost, annually	3000	2300	2300	4000	2500	2800
Date of construction	1960	1963	1964	1964	1932	1958

[a] Dano system — Continual mixing aeration, grinding in one unit. Refuse and sewage sludge is held for 3–5 days in rotating drum with blower and air manifolds. Should be windrowed after leaving drum before sale.

[b] Dorr-Oliver rasping system — Initial sorting, grinding, roller crushing, and gravity separation followed by windrow composting. Turning every 3–5 months. Windrow height 5–10 feet outdoors on impervious surface.

[c] Ventilated cells — Composting in cells with natural or forced ventilation. Intermittent disturbances. Rotary screening, sorting, salvaging and ballistic (gravity) separation.

[d] Buhler system — No sorting, grids refuse in rotary hammermill, then passes over permanent magent.

[e] Van Maanen — Unprocessed refuse wetted and decomposed in huge windrows along railway siding. Turned every 4–6 months.

Source: G. J. Kupchik, *J. Sanit. Eng. Div.*, Am. Soc. Civ. Eng., 92 41, 1966. Footnotes from P. Jones, *Eng. J.*, 52(6):34, June 1969

PRODUCTION AND SALES OF COMPOST

System	Population served	Raw refuse processed, U.S. tons	Compost produced, U.S. tons	Compost sold, U.S. tons	Sales income, $	Income, $/ton of: Compost sold	Income, $/ton of: Refuse processed
Dano	700,000	99,000	66,000	33,000	24,000	0.73	0.24
	170,000	46,500	25,800	25,800	171,000	6.63	3.68
	80,000	18,800	13,200	9,900	9,900	1.00	0.53
	54,000	9,900	4,500	4,400	14,000	3.18	1.41
	210,000	32,400	5,300	4,300	2,700	0.63	0.08
	1,214,000	206,600	114,800 (56%)	77,400	221,600	2.86	1.07
Dorr-Oliver	700,000	199,000	74,200	37,400	204,000	5.45	1.03
	130,000	26,400	18,100	17,600	28,300	1.61	1.07
	75,000	17,700	13,200	13,000	24,000	1.85	1.36
	905,000	243,100	105,500 (43%)	68,000	256,300	3.77	1.05
Others	27,000	9,300	5,500	5,500	29,000	5.27	3.12
	90,000	16,800	10,100	0	0	0.00	0.00
	100,000	18,800	8,800	8,800	13,200	1.50	0.70
	800,000	162,000	55,000	57,200	72,000	1.26	0.44
	1,017,000	206,900	79,400 (38%)	71,500	114,200	1.60	0.55
Total	3,136,000	656,600	299,700 (46%)	216,900 (33%)	592,100	2.73	0.90

Source: *Economics of Composting Municipal Refuse in Europe and Israel*, Am. Publ. Health Assn., 1965.

SALES DISTRIBUTION OF COMPOST FROM MUNICIPAL REFUSE IN HOLLAND

Outlet	Year: 1961	Year: 1965
Forestland improvement	2.4	0.6
Basic agriculture (field and row crops, and for pig litter)	34.4	16.4
Fruit farming	6.5	6.3
Hotbed vegetable farming[a]	11.6	13.0
Greenhouse vegetable farming	7.9	8.4
Flower and flower bulb production (greenhouse and outdoor)	11.7	17.6
City park, sportfield, and recreational use	25.5	37.7

[a] Hotbed compost is freshly ground domestic refuse. It is used on the bottom of the hotbed in place of horse manure. The biological process of composting generates heat that makes the hotbed crop grow. Hotbed crops in Holland are cucumbers, melons, and green peppers.

Source: *Solid Waste Management/Composting*, U.S. Department of Health, Education, and Welfare, Public Health Service, 1968, p. 23.

TRANSPORTATION COSTS FOR PRODUCT COMPOST SALES

Dollars Per Ton

The municipality and its composter have no control over location of the market. The cost of shipping urban produced compost to either the rural consumer grower or the regional commercial fertilizer blending plant is a marketing distribution constraint.

Miles	Class 20[a] (humus, sewage sludge, etc)	Class 22½[a] (peat moss)
100	$ 6.40	$ 7.20
200	8.40	9.40
300	10.00	11.20
400	11.60	13.00
500	13.00	14.60
600	14.20	16.00
800	17.00	19.20
1,000	19.20	21.60

[a] Figures are from J.D. Hackler, *Uniform Freight Classification*, September 20, 1966. They indicate the cost per ton for two slightly different commodity freight classes.

Source: *Technical-Economic Study of Solid Waste Disposal Needs and Practices*, U.S. Department of Health, Education, and Welfare, Public Health Service, 1969, p. 22.

ESTIMATED COSTS FOR WINDROW COMPOSTING PLANTS

1969

Item	Plant capacity in tons per day: 52 Johnson City, 1 shift, 7,164 tons, 1968[a]	50 1 shift, 13,000 ton/year[b]	100 2 shifts, 26,000 ton/year[b]	100 1 shift, 26,000 ton/year[c]	200 2 shifts, 52,000 ton/year[c]
Capital costs					
Buildings	$368,338	$210,000	$231,000	$231,000	$251,000
Equipment	463,251	482,700	482,700	607,100	607,100
Site improvement[d]	126,786	126,800	126,800	152,000	152,000
Land cost[e]	7,600	8,400	12,400	12,400	21,200
Total	$965,980	$827,900	$852,900	$1,002,500	$1,031,300
Total per ton daily capacity	$18,580	$16,560	$8,530	$10,020	$5,156
Annual operating costs					
Depreciation[f]	$47,920	$41,000	$42,000	$49,500	$53,550
Interest[g]	45,080	38,600	39,800	46,200	51,000
Operations[c]	99,575	133,950	213,795	197,850	357,015
Maintenance	32,590	43,700	59,150	59,850	95,400
Total	225,165	257,250	354,745	353,400	556,965
Operating cost per ton refuse processed	31.43	19.77	13.65	13.58	10.71

[a] Actual costs of plant as built at Johnson City. Plant operates on 1-shift day. Cost per ton based on 1968 level of 7,164 tons of refuse processed.
[b] Based on Johnson City plant cost data adjusted for less elaborate equipment, buildings, and modifications.
[c] Estimates based on actual Johnson City cost data projected to the larger daily capacity plants.
[d] Includes preparation of composting field with crushed stone and needed utility lines.
[e] Land costs are estimated based on approximate land values near Johnson City, Tennessee, of $800 per acre.
[f] Straight line depreciation over 20 years of buildings and equipment, excluding land.
[g] Bank financing at 7½ per cent over 20 years. Yearly figure is average of 20-year total interest charge. Land cost included.

Source: A.W. Breidenbach *et al.*, *Composting of Municipal Solid Wastes in the United States*, U.S. Environmental Protection Agency, 1971, p. 59.

COMPARISON OF ESTIMATED CAPITAL COSTS[a]

Energy and Manpower Requirements for Mechanical Compost Plants

Capacity, ton/day	Fairfield			Metrowaste			IDC		
	$\$ \times 10^6$	HP	Labor	$\$ \times 10^6$	HP	Labor	$\$ \times 10^6$	HP	Labor
100	1.4[b]	900[b]	8[b]	0.9	1,250	12	1.4	600	20
200	2.1[b]	1,400[b]	11[b]	1.2	1,700	17	2.1[b]	800[b]	28[b]
300	2.5	1,700	14	1.5	1,900	25	2.7[b]	950[b]	36[b]
400	3.2	2,500	20	1.6	2,000	30	3.2[b]	1,100[b]	45[b]

[a] Exclusive of cost or land and special foundation problems (fill and/or piling).
[b] Author's estimate based on chemical engineering estimating procedures.

Source: *Surgeon General's Conference on Solid Waste Management, Proceedings for Metropolitan Washington,* U.S. Department of Health, Education, and Welfare, Public Health Service, 1967, p. 115.

REFERENCES

1. J.S. Coulson, Sales Manager ...er Division, Fairfield Engineering Company, Personal communication, June 15, 1967.
2. V. Brown, President, Metropo... ...aste Conversion Corporation, Personal communication, July 13, 1967.
3. R.A. Lynn, Plant Manager, Inter...onal Disposal Corporation, St. Petersburg, Fla., Personal communication, June 21, 1967.

ESTIMATED COST TO OWN AND OPERATE DIGESTER PLANTS

Daily capacity of plant, tons	Annual tonnage, 5 day week	Number of plant employees	Construction costs: Machinery	Construction costs: Buildings and utilities	Cost per ton of refuse to amortize plant[a]	Cost per ton of refuse to operate plant[b]
100	26,000	15	$1,200,000	$ 500,000	$6.75	$9.25
200	52,000	18	2,000,000	700,000	5.25	6.75
300	78,000	23	2,600,000	900,000	4.50	6.50
400	104,000	26	3,200,000	1,100,000	4.25	6.00

[a] Land not included (5 to 10 acres required). Amortization 20 years on buildings and stationary machinery and 5 years on mobile equipment. Interest at 9%.
[b] Real estate and personal property tax not included. No credit taken for sale of plant byproducts (This revenue will cover cost of byproduct marketing and provide profit for the marketing company).

Source: Fairfield Engineering Company, Marion, Ohio, 1972.

ESTIMATED INVESTMENT COSTS FOR COMPOSTING PLANTS

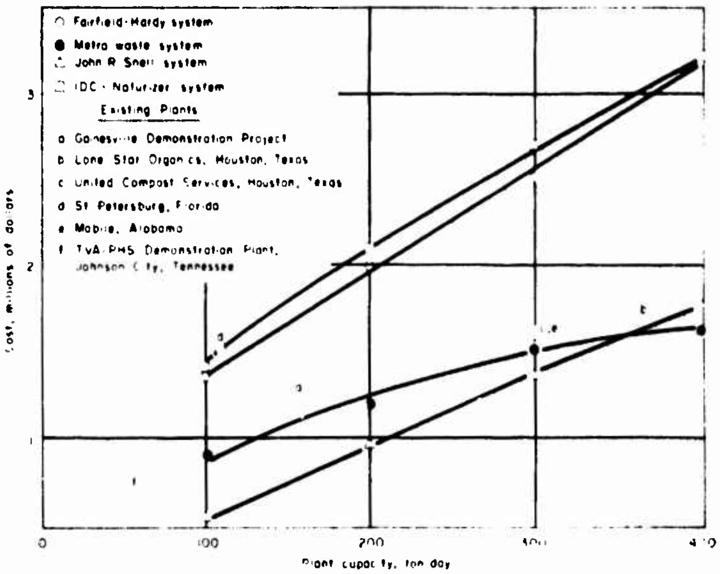
Windrowing and Enclosed Digestion Systems

Item of cost	150 ton/day capacity	
	Windrowing	Enclosed
Construction and equipment	$185,500.00[a]	$300,800.00[b]
Depreciation[c]	9,280.00	15,040.00
Interest, 7½%[d]	8,660.00	14,040.00
Capital cost per ton daily capacity	1,237.00	2,005.00
Total cost per ton refuse processed	0.46	0.75
Land	9,300.00	2,640.00
Interest, 7½%	430.00	120.00
Cost per ton daily capacity	62.00	18.00
Cost per ton of refuse processed[e]	0.01	< 0.01 (.003)
Total cost		
Per ton of daily capacity	1,300.00 (1,550.00)[f]	2,023.00
Per ton of refuse processed	0.47 (0.52)[f]	0.75

[a] Based on costs from PHS-TVA Composting Plant at Johnson City, Tennessee, and land at $800 per acre.
[b] Based on costs from composting plant at Gainesville, Florida, and land at $4,000 per acre.
[c] Straight line depreciation of equipment and buildings over 20 years.
[d] Average yearly interest, bank financing over 20 years.
[e] Computed from interest only; land is assumed not to depreciate.
[f] Computed with comparable land values estimated at $4,000 per acre.

Source: A.W. Breidenbach *et al.*, *Composting of Municipal Solid Wastes in the United States.* U.S Environmental Protection Agency, 1971, p. 63.

CAPITAL COSTS OF COMPOSTING SYSTEMS



Source: "Processing and Recovery of Municipal Solid Waste," *J Sanit. Eng Div.*, Proc. Am. Soc. Civ. Eng., June 1970, p. 710.

COMMERCIAL VENTURE COMPOST PLANT[a]

160 Ton/Day; 50,000 Tons Annually; Capital Needs $1,500,000

	Rate per ton	Amount
Operating costs		
Labor and payroll expense	$3.28	$164,000
Utilities	0.42	21,000
Supplies	0.40	20,000
Repairs	0.50	25,000
Travel	0.04	2,000
Telephone	0.12	6,000
Equipment rental	0.03	1,500
Licenses and fees	0.02	1,000
Consultants	0.05	2,500
Contract hauling	0.26	13,000
Total controllable expense	5.12	$256,000
Insurance	0.20	10,000
Land rental	0.12	6,000
Property taxes	0.20	10,000
Legal and audit	0.09	4,500
Management fee	0.60	30,000
Franchise taxes, start-up expense, etc	0.20	10,000
Total noncontrollable expense	$1.41	$ 70,500
Total operating expense	$6.53	$326,500
Depreciation or debt service		
Debt service = $1,200,000 at 6½% for 20 years equals $107,424 per year; depreciation on $1,250,000 at 8% annually is $100,000. Capital needs include some working capital, which is not depreciable	$2.15	$107,500
Total operating expense	$8.68	$434,000
Less credits for		
Sludge	$0.10	$ 5,000
Metal and paper salvage	1.30	65,000
Compost	2.00	100,000
Total credits	$3.40	$170,000
Net cost for 50,000 tons	$5.28	$264,000

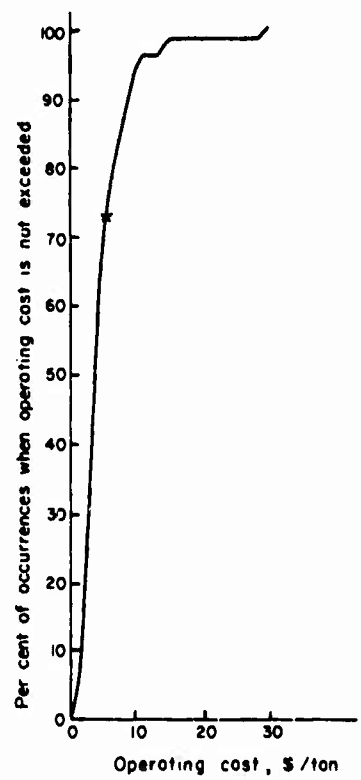
[a] Data as for the 160-ton per day plant at Gainesville, Florida, which receives the refuse from the City of Gainesville and the University of Florida. Operating costs for a plant of this size were estimated by its operators on an annual and per ton basis.

[b] The net cost of $5.28 per ton is predicted upon finding a market for the compost produced from 50,000 tons per year of refuse. A recent study made for Riverview, Michigan, covering an estimated population of 319,970, by Johnson and Anderson, Inc., Consulting Engineers, had the following to say regarding the marketing of compost:

> "This study of the possible uses of refuse compost from a manufacturing facility located in lower Michigan indicates the presence of a specialized market probably large enough to absorb 25,000 tons annually of compost out of an annual production of from 25,000 44,000 tons from the Riverview plant, provided that there is no immediate development of additional compost manufacturing capacity in the Ohio-Michigan region."

Source: *Master Plan for Solid Waste Collection and Disposal, Tri-Parish Metropolitan Area of New Orleans*, U.S. Department of Health, Education, and Welfare, Public Health Service, 1969, p. IV-4.

CUMULATIVE FREQUENCY DIAGRAM OF OPERATING COSTS FOR 78 MUNICIPAL INCINERATORS IN DOLLAR PER TON INCREMENTS



Note: At the asterisk, 73 per cent of the incinerators have operating costs below $5.00 per ton solid waste received.

Source: *Incinerator Guidelines*, U.S. Department of Health, Education, and Welfare, Public Health Service, 1969, p. 9.

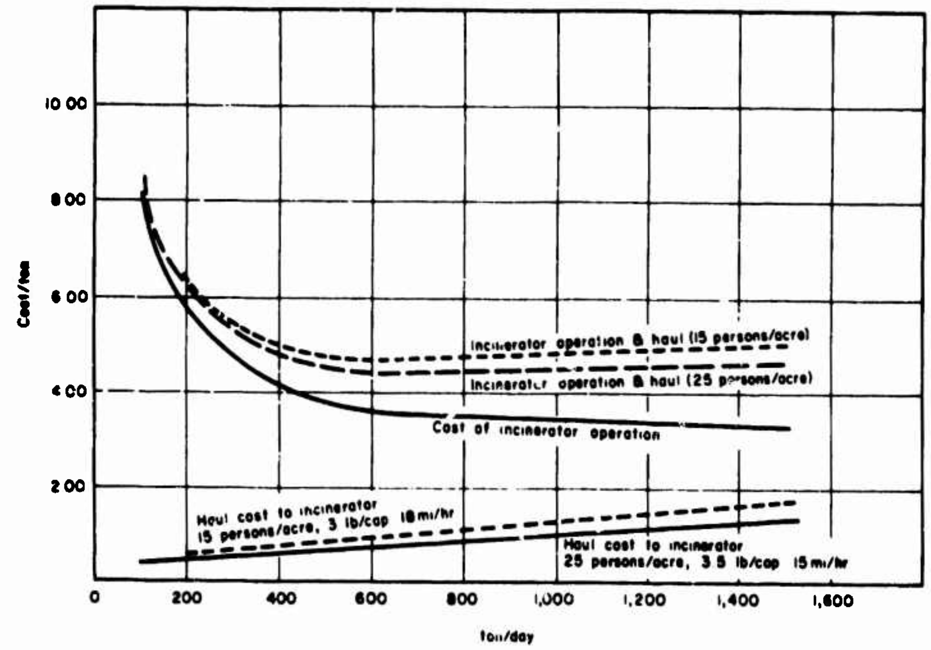
INCINERATION COSTS, 1967–68

Cost Per Ton

Division of operating costs	Actual costs, 1967						Estimated costs, 1968			
	Florida Ave.		Seventh St.		Algiers		St. Louis		New Orleans East	
	$	%	$	%	$	%	$	%	$	%
Labor and fringe benefits	3.45	62	2.77	57	4.01	56	1.55	53	1.65	46
Utilities, fuels, maintenance repairs, license, and insurance	1.22	22	1.06	22	1.33	19	.49	17	.42	12
Subtotal	4.67		3.83		5.34		2.04		2.07	
Depreciation and amortization[d]	.90	16	1.04	21	1.57	23	.88	30	1.50	42
Total cost per ton	5.57		4.87		6.91		2.92		3.57	
Capacity of plant, ton/day										
Rated capacity	400		400		200		450		400	
Effective capacity	200		270		150		410		365	

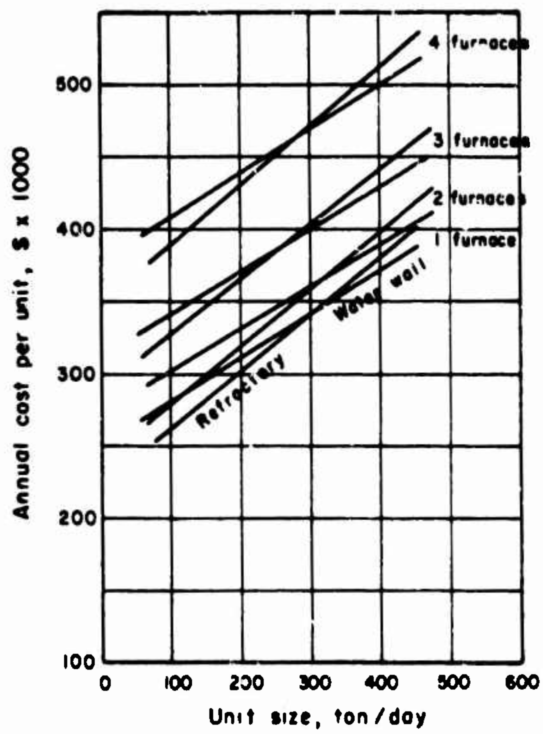
Source: *Master Plan for Solid Waste Collection and Disposal, Tri-Parish Metropolitan Area of New Orleans*, U.S. Department of Health, Education, and Welfare, Public Health Service, 1969, p. V-37

ECONOMIC SIZE OF INCINERATORS – COST OF OPERATION AND HAUL



Source: *Master Plan for Solid Waste Collection and Disposal, Tri-Parish Metropolitan Area of New Orleans,* U.S. Department of Health, Education, and Welfare, Public Health Service, 1969, p. VII-3.

COMPARATIVE COST OF MULTIPLE UNIT REFRACTORY AND WATER WALL INCINERATORS EXCLUSIVE OF LAND, LANDSCAPING, AND RESIDUE DISPOSAL.



Source: *Proposals for a Refuse Disposal System in Oakland County, Michigan*, U.S. Department of Health, Education, and Welfare, Public Health Service, 1970.

APPROXIMATE COSTS OF RECOMMENDED MULTIP: C CHAMBER INCINERATORS AND SCRUBBERS IN 1968[a]

Size of incinerator, lb/hr	General refuse incinerators	Scrubbers[b]	Pathological incinerators
50	$ 1,200	$ 2,200	$2,000
100	1,700	3,000	2,700
150	2,000	3,600	4,000
250	2,700	4,400	5,500[c]
500	5,000	6,200	
750	9,500	7,600	
1,000	12,500	8,800	
1,500	20,000	11,200	
2,000	25,000	13,200	

[a] Incinerator costs are exclusive of foundations.
[b] Scrubber costs are exclusive of foundations but include reasonable utility connections.
[c] For a 200 lb/hr incinerator.

Source: *Interim Guide of Good Practice for Incineration at Federal Facilities*, U.S. Department of Health, Education, and Welfare, Public Health Service, 1969.

ESTIMATED CAPITAL INVESTMENTS AND OPERATING COSTS,[a] INCINERATOR AND INCINERATOR BOILER PLANTS

Refuse Design Capacity 4,000 Tons Per Week

	Case I Refractory furnace	Case II Refractory furnace with boiler	Case III Waterwall furnace with boiler	Case IV Waterwall furnace
Capital costs				
General building construction	$930,000	$1,215,000	$1,030,000	$938,000
Equipment delivered to site	$1,340,000	$2,620,000	$2,230,000	$2,150,000
Mechanical contract	$1,075,000	$1,580,000	$800,000	$983,000
Electrical contract	$238,000	$322,000	$237,000	$232,000
Total incremental cost	$3,583,000	$5,737,000	$4,297,000	$4,303,000
Annual operating expenses				
Operating days per week	5	7	7	5
Maintenance labor and supplies	$140,000	$161,000	$147,000	$123,000
Operating labor	$326,000	$495,000	$495,000	$365,000
City water	$28,000	$25,000	$43,000	$30,000
Auxiliary fuel		$140,000	$187,000	$10,000
Electric power	$161,000	$184,000	$174,000	$161,000
Operating supplies and chemicals	$1,000	$2,000	$3,000	$1,000
Subtotal	$656,000	$1,007,000	$1,049,000	$690,000
Fixed charges on investment	$276,000	$442,000	$331,000	$331,000
Estimated total annual expense	$932,000	$1,449,000	$1,380,000	$1,021,000
Estimated value of steam per 1,000 pounds		$1.06	$0.4[illegible]	

[a] Capital investments and operating expenses include only those variables affected by plant design. They are not intended to include all costs of operation or construction at the incinerator plant.

Source: *Special Studies for incinerators for the Government of the District of Columbia*, U.S. Department of Health, Education, and Welfare, Public Health Service, 1968, p. 70.

TYPICAL COMPARATIVE COST FIGURES FOR FURNACE SYSTEMS

3 Units @ 300 Ton/Day

	Water furnace with waste heat boiler	Refractory lined furnace	Refractory lined furnace with waste heat boiler	Refractory furnace with rotary kiln
Incinerator structure	$2,240,000	$2,290,000	$2,240,000	$2,290,000
Utility construction	259,000	265,000	256,000	265,000
Furnace components	2,933,000	903,000	2,375,000	3,253,000
Air pollution control equipment	690,000	1,500,000	900,000	1,500,000
Estimated project cost	$6,122,000	$4,958,000	$5,771,000	$7,308,000
Amortization of capital cost Based on 4½% annual interest, 20 yr bonds	$ 472,000	$ 380,000	$ 447,000	$ 563,000
Plant labor	520,000	495,000	520,000	496,300
Utilities	15,000	35,000	15,000	36,500
Building supplies, operation and maintenance	193,000	312,000	280,000	350,400
Estimated annual cost	$1,200,000	$1,220,000	$1,262,000	$1,446,200

Source: *Proposals for a Refuse Disposal System in Oakland County, Michigan*, U.S. Department of Health, Education, and Welfare, Public Health Service, 1970, p. 30.

DISTRIBUTION OF INCINERATOR CONSTRUCTION COSTS FOR EQUIPMENT AND BUILDING

Dollars Per Ton Per Day[a]

	Architectural and structural	Mechanical	Electrical	Heating and ventilating, plumbing and miscellaneous	Total cost	% of total
Delivery of refuse tipping floor, scales and accessories	337	4	14	18	373	8
Handling of refuse (storage pit, crane hoppers and accessories)	658	141	14	27	840	17
Burning of refuse (furnaces, flues, chimneys, combustion chamber and accessories)	955	1,321	121	55	2,452	51
Residue removal (ash cellar, conveyors, controls and accessories)	309	108	66	41	524	11
Fly ash removal (subsidence chambers, screens, and accessories)	113	15	9	9	146	3
Miscellaneous (utilities, grading, land scaping demolition, furniture tools)	313	127	30	16	486	10
Total costs	2,685	1,716	254	166	4,821	100
Per cent distribution	55%	36%	5%	4%	100%	

[a] 1958 cost index.

Source: *J. Sanit. Eng. Div.*, Am. Soc. Civ. Eng., *90*, June 1964.

COMPARATIVE COSTS FOR TWO TYPES OF INCINERATORS, CHICAGO

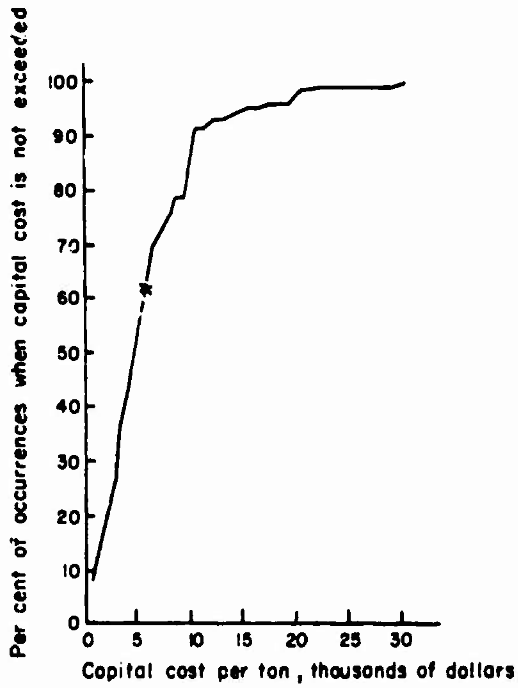
1962 Costs

	Mechanized continuous type rotary kiln	Manually stoked batch type
Total construction costs per ton per day of capacity (including engineering but exclusive of land)	\$4,500.00	\$3,900.00
Total operating costs per ton of refuse destroyed	5.86	6.06
Operating less residue disposal	1.40	1.62
Maintenance and repair	1.95	1.35
Administration and supervision	.56	.51
Pension	.20	.23
Fuel and utilities	.30	.14
Amortization	.00[a]	1.19

[a] Steam generation and metal salvage profits cover amortization costs.

Source: *Municipal Refuse Disposal*. Institute for Solid Wastes, Am. Publ. Works Assn., 1970, p. 155.

CUMULATIVE FREQUENCY DIAGRAM OF CAPITAL COSTS FOR 170 MUNICIPAL INCINERATORS IN $1,000 INCREMENTS.



Note. At the asterisk, 62 per cent of the incinerators have capital costs below $6,150 per ton (24-hour design capacity).

Source: *Incinerator Guidelines*, U.S. Department of Health, Education, and Welfare, Public Health Service, 1969, p. 8.

COST ESTIMATES FOR INCINERATION

Quantities

20th year	423,000 tons
Average year	346,000 tons

Daily quantity average, 20th year, 19
423,000 x 7/6 : 365 = 1,350 ton/day average

Capacity = 1.2 x 1,350 = 1,620 ton/day rated capacity

Cost estimates

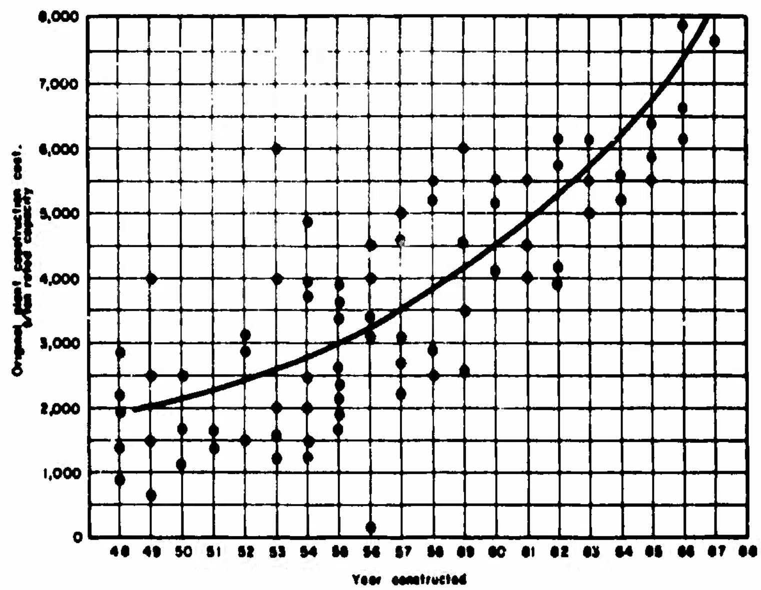
First cost @ $7,500/ton x 1,630 = $12,225,000	
Amortized for 20 years @ 4.5% (0.0768)	$ 939,000
Operating and maintenance @ 3.48/ton for average year x 346,000 =	1,201,000
Hauling residue to landfill,	
20% of average yr x 346,000 = 69,200 tons @ $1.74 tust ton	120,000
Total cost of incineration for average year	$2,242,000

Cost per ton incinerated
$2,260,000 : 346,000 tons = $6.50 per ton

Note First cost = $6,800 + 10% for administration and engineering = $7,500 per rated ton. Cost of $6,800 was selected arbitrarily from reported costs ranging from $4,900 to $9,100. Actual costs must be based on detailed designs. These estimates are adequate only for establishing the magnitude of the cost per ton of incineration capacity. The operating and maintenance costs are similarly approximate.

Source: *Collection and Disposal of Solid Waste for the Des Moines Metropolitan Area.* U.S. Department of Health, Education, and Welfare, Public Health Service. 1968, p. 4-6

ORIGINAL CONSTRUCTION COSTS FOR 74 CENTRAL INCINERATORS BUILT FOR MUNICIPALITIES BETWEEN 1948 AND 1968



Source: Prepared from data of the Solid Wastes Engineering Section, Committee on Sanitary Engineering Research, Am. Soc. Civ. Eng.

POWER FROM INCINERATION

STEAM AND POWER FROM INCINERATION

	Total annual tons incinerated	Total steam generated		Utilization of steam: Electric power generated		
		Tons	lb of steam/ lb of refuse	Total kWh	kWh/ton of refuse	Space heating total tons
Paris, France	623,000	712,000	1.14	14,200,000	75	495,000
Hamburg, Germany	330,000	460,000	1.40	60,000,000	180	
Zurich, Switzerland	75,000	121,000	1.60	5,500,000	110	40,000

Source: C. Rogus. *Public Works*, *93*(7):75, June 1962.

SUMMARY OF OPERATING COSTS FOR CHICAGO SOUTHWEST MUNICIPAL HEAT-RECOVERY INCINERATOR

	Operating cost, $/ton
Cost item	
Labor (62 men)	$1.92
Repairs	0.73
Electrical	0.19
Supplies	0.60
Residue hauling	1.05
Steam production (4,000 lb at $0.50/1,000 lb)	2.00
	6.49
Income item	
Sales of steam (4,000 lb at $0.625/1,000 lb)	2.70
Profit from salvage	0.14
	2.84
Net operating cost	3.65
Amortization of capital cost	1.26[a]
Total operation and maintenance cost	4.91[b]

[a] These calculations assume 100 per cent steam utilization. ASME states that actual operating cost is $3.98 per ton implying that only 86 per cent ($\frac{2.70 - 0.38}{2.70}$) steam utilization is practiced.

[b] ASME gives $5.24 per ton, again reflecting less than 100 per cent steam utilization.

Source: Am. Soc. Mech. Eng., Incinerator Committee, June 1966.

SANITARY LANDFILL COLLECTION COSTS
(Continuation)

Labor costs per hour		
Basic wage rate for collection crew member	$3.50	
Plus 20% for vacation, sick leave, retirement, etc	$4.20	
Plus 20% for supervision and administration overhead	$5.04	
Total hourly labor cost per man (for this study)	$5.05	
Vehicle costs per hour		
Initial cost of 4-ton payload vehicle	$14,000.00	
Amortization cost/hr	$1.37[a]	
Operation and maintenance cost/hr	$2.50	
	$3.87	
Total hourly vehicle cost (for this study)	$3.90	
Total vehicle and labor costs	**2-man truck**	**3-man truck**
Vehicle cost/hr (4-ton unit)	$3.90	$3.90
Labor cost/hr	$10.10	$15.15
Total hourly cost, 1968	$14.00	$19.05
Yearly working hours[b]		
Great Falls (40 hr/wk) (52 wk/yr) - 72 hr	2,008 hr/yr	
Rural (32 hr/wk) (52 wk/yr) - 72 hr	1,592 hr/yr	
Great Falls Metropolitan area[c] (21 trucks) (2,008 hr)	42,168 hr/yr	
Rural area[d] (2 trucks) (1,592 hr)	3,184 hr/yr	
Great Falls Metropolitan area[e] (13 trucks) (2,008 hr)	26,100 hr/yr	
Rural area only, excluding Great Falls inside city limits[d] (3 trucks) (1,592 hr)	4,776 hr/yr	
Annual collection costs		
Alternate 1[f]		
Metropolitan Great Falls area (42,168 hr/yr) ($19.05/hr)	$803,300	
Rural area (3,184 hr/yr) ($14.00/hr)	$ 44,576	
Total	$847,876	
Alternate 2		
Metropolitan Great Falls area (26,100 hr/yr) ($19.05/hr)	$497,205	
Rural area (3,184 hr/yr) ($14.00/hr)	$ 44,576	
Total	$541,781	
Alternate 3		
Rural area (4,776 hr/yr) ($14.00/hr)	$ 66,864	
Total	$ 66,864	

[a] Amortization based on 6 years without interest or salvage value. Replacement cost increase based on 3%/yr.
[b] 1968; 9 holidays per week.
[c] 3-man crew, twice per week pickup.
[d] 2-man crew, once per week pickup.
[e] 3-man crew, once per week pickup.
[f] Alternate 1 includes rural routes with once per week collection and Great Falls with twice per week collection. Alternate 2 includes rural routes with once per week collection and Great Falls with once per week collection. Alternate 3 includes rural routes and the area adjacent to the Great Falls city limits with once per week collection. Under this alternate Great Falls would continue to operate its existing system and would not be included in the county-wide program.

Source: *Comprehensive Study of Solid Waste Disposal in Cascade County, Montana*, U.S. Department of Health, Education, and Welfare, Public Health Service, 1970, p. 149.

SANITARY LANDFILL OPERATION AND MAINTENANCE COSTS

	Including Great Falls	Rural only
Annual operating costs		
Payroll Great Falls		
2 equipment operators @ $650/mo	$15,600	
Payroll Rural		
1 equipment operator @ $650/mo	$ 7,800	$ 7,800
Total labor per year	$23,400	$ 7,800
Plus 20% for vacation, sick leave, retirement, etc	$28,080	$ 9,360
Plus 20% for supervision and administration overhead		
Total	$33,700	$11,230
Annual equipment maintenance		
Great Falls - (140 hr/wk) (50 wk)(50¢ hr)	$ 3,500	
Rural - (40 hr/wk) (50 wk)(50¢ hr)	$ 1,000	$ 1,000
Total	$ 4,500	$ 1,000
Supplies necessary for landfill maintenance		
Great Falls	$ 1,000	
Rural	$ 3,000	$ 3,000
Total	$ 4,000	$ 3,000
Total per year	$42,200	$15,230

Source: *Comprehensive Study of Solid Waste Disposal in Cascade County, Montana*, U.S. Department of Health, Education, and Welfare, Public Health Service, 1970, p. 148.

SUMMARY OF OPERATION, MAINTENANCE AND REPLACEMENT COSTS FOR A SANITARY LANDFILL (Continuation)

Alternate 1

Replacement of land and landfill equipment	$51,873/yr
Landfill operation and maintenance	$42,200/yr
Collection costs including vehicle replacement	$847,876/yr
TOTAL	$941,949/yr

Cost per ton produced $\dfrac{\$941{,}949}{35{,}600 \text{ ton/yr}} = \$26.46/\text{ton}$

$26.46/ton x 73%[a] = $19.32/ton for residential dwelling

$19.32/ton x 1.84 ton/res. dwelling yr[b] = $35.55/res. dwelling yr

Alternate 2

Replacement of land and landfill equipment	$51,873/yr
Landfill operation and maintenance	$42,[illegible]00/yr
Collection costs including vehicle replacement	$541,781/yr
TOTAL	$635,854/yr

Cost per ton produced $\dfrac{\$635{,}854}{35{,}600 \text{ ton/yr}} = \$17.86/\text{ton}$

$17.86/ton x 73%[a] = $13.04/ton for residential dwelling

$13.04/ton x 1.84 ton/res dwelling yr[b] = $24.00/res. dwelling yr

Alternate 3

Replacement of land and landfill equipment	$14,183/yr
Landfill operation and maintenance	$15,230/yr
Collection costs including vehicle replacement	$66,864/yr
TOTAL	$96,277/yr

Total cost per dwelling[c] $\dfrac{\$96{,}277}{2{,}690 \text{ dwellings}} = \$35.79/\text{res dwelling yr}$

[a] For the City of Great Falls, 73% of the total revenue is from residential billing and the remaining 27% is from commercial.

[b] Obtained by dividing the total refuse produced by the total number of residential dwellings.

[c] Since commercial firms are a small percentage of total rural services, rates are based on residential charges.

Source: *Comprehensive Study of Solid Waste Disposal in Cascade County, Montana*, U.S. Department of Health, Education, and Welfare, Public Health Service, 1970, p. 150.

COST ESTIMATES FOR SANITARY LANDFILL OPERATIONS (Continued)

	hr/yr each	hr/yr total	Rate/hr	Cost/yr	
Annual maintenance and site development					
2 Sites @ $20,000 each					$ 40,000
Equipment purchase					
Cost of new equipment (one time purchase only)					$240,000
Equipment maintenance, operation, and amortization					
3 bulldozers	3,060	9,180	$15.00	$137,700	
1 scraper	2,080	2,080	10.00	20,800	
1 grader	2,080	2,080	5.00	10,400	
1 truck	1,040	1,040	4.00	4,160	
1 tractor/mower	1,040	1,040	2.00	2,080	
2 pick-up trucks				2,000	
Miscellaneous equipment		2,080		5,000	
Total equipment at 2 sites		17,500			$182,140
Labor					
Equipment operators		17,500	$ 4.00	$ 70,000	
Laborers, 4 per site		8,320	3.40	28,300	
Foreman, 1 per site		4,160	4.25	17,700	
Gate keeper/fee collector (16 man hr/day site)		9,800	3.75	37,000	
Total labor, 2 sites		39,780			$153,000
Metro agency headquarters and repair shop					
Office				$ 36,000	
Repair shed				50,000	
Repair equipment				60,000	
				$146,000	
50% each for collection and disposal					$ 73,000
Miscellaneous expense, overhead, and contingency					$100,000

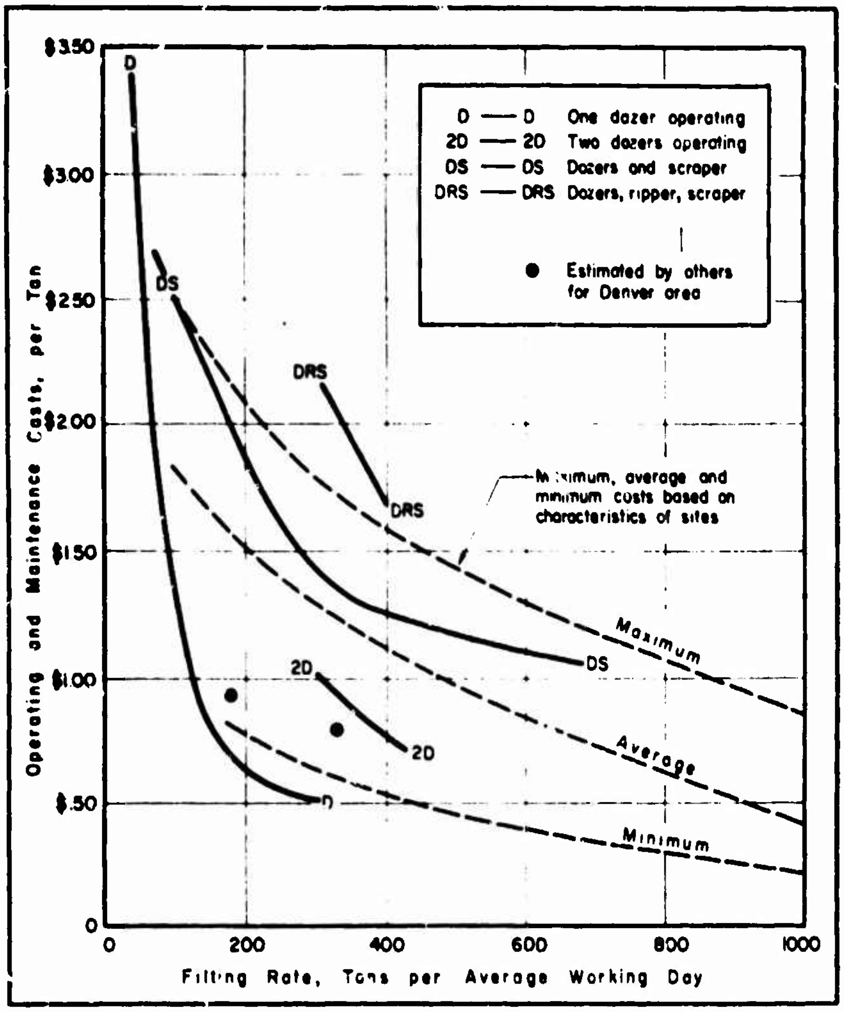
Source: *Collection and Disposal of Solid Waste for the Des Moines Metropolitan Area*, U.S. Department of Heal Education, and Welfare, Public Health Service, 1968, p. 4 - 29.

COST ESTIMATES FOR SANITARY LANDFILL OPERATIONS

Basic Cost Data

Land costs			
Northeast site	240 acres @ $1,200/acre	$288,000	
Southwest site	282 acres @ $1,000/acre	282,000	
Total estimated land costs			$570,000
Initial site development (one site example)			
Scale house		$ 30,000	
Two scales @ $9,000		18,000	
Scale equipment		10,000	
Equipment shed and personnel facilities		30,000	
Watermains, 8" x 3,000'		15,000	
Perimeter fencing, 10,000'		5,000	
Entrance fencing, 1,000'		5,000	
On site gravel surfacing for roads		18,000	
Grading		35,000	
Landscaping		14,000	
Yard lighting		5,000	
Apron pavement		5,000	
Miscellaneous		10,000	
Total site development cost, one site		$200,000	
Total site development cost, two sites			$400,000

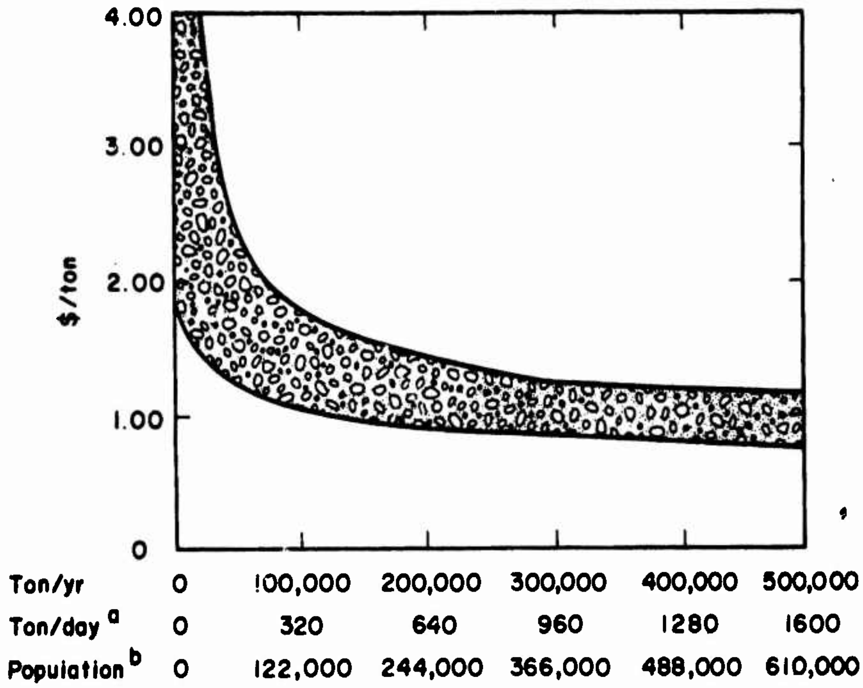
ESTIMATED SANITARY LANDFILL OPERATION AND MAINTENANCE COSTS



Note : Chart shows how cost of ownership and operation of equipment relates to the required filling rate.

Source: *Public Works, 100*(3) 79, March 1969

Sanitary Landfill Operating Costs.



[a] Based on 6-day work week.
[b] Based on national average of 4.5 lb/person day.

Source: *Sanitary Landfill Facts*, U.S. Department of Health, Education, and Welfare, Public Health Service, 1970, p. 23.

RESULTS OF SOIL ANALYSES FOR SELECTED LANDFILL SITES

Material description	Unified soil classification	Wet density,[a] lb/ft³	Moisture content, %	Dry density, lb/ft³	Porosity	Void ratio
Gravelly sand	SW	131.0	7.7	122.5	0.272	0.374
Silty shale	–	101.2	22.6	94.2		
Silty clay	CL	128.5	11.1	115.5	0.294	0.416
Sandy silt	ML	110.5	14.8	101.5	0.364	0.573
Silty sand	SM	118.5	7.3	110.5	0.332	0.497
Silty clay (diatomaceous)	CL	51.5	16.0	44.4	0.704	2.38
Silty clay (diatomaceous)	CL	106.2	6.2	100.0	0.359	0.560
Sandy silt	ML	137.5	19.6	115.0	0.300	0.429
Silty clay	CL	99.0	14.5	86.3	0.429	0.750
Gravelly sand	SW-SM	111.5	7.8	103.5	0.382	0.618
Gravelly sand with silt	SM	114.5	4.4	109.5	0.346	0.530
Gravel-sand and silt mixture	GW-GM	101.5	3.2	98.2	0.418	0.707

[a] In place.

Source: *Development of Construction and Use Criteria for Sanitary Landfills.* County of Los Angeles, U.S. Department of Health, Education, and Welfare, Public Health Service, 1960, p. III-6.

COSTS FOR MARINE DISPOSAL OF WASTES IN U.S. COASTAL WATERS

1968

Type of waste	Total U.S.		Pacific Coast		Atlantic Coast		Gulf Coast	
	Average cost/ton	Reported range, $/ton	Average cost/ton	Reported range, $/ton	Average cost/ton	Reported range, $/ton	Average cost/ton	Reported range, $/ton
Dredging spoils	$.40	$.20–.55	$.43	None	$ .54	$.40–.55	$.25	$.20–.25
Industrial wastes								
Bulk	$1.70	$.60–9.50	$1.00	$.60–9.50	$1.80	$.60–7.00	$2.30	$.75–3.50
Containerized	$24	$5–130	$53	$50–130	$7.73	$5–17	$28	$10–40
Refuse and garbage	$15	$5–60	$15	$5–60				
Sewage sludge	$1.00	$.80–1.20			$1.00	$.80–1.20		
Construction and demolition debris	$.75	$.70–1.35			$ .75	$.70–1.35		
Explosives	$15	$15–90						
Miscellaneous	$15	$5–600	$15	$5–600				

Sources: *J. Sanit. Eng. Div.*, Am. Soc. Civ. Eng., 96:1387, 1970 and *Ocean Disposal of Barge-Delivered Liquid and Solid Wastes from U.S. Coastal Cities*, U.S. Environmental Protection Agency, 1971, p. 10.

COSTS FOR DISPOSAL OF LIQUID WASTES

Disposal Method	Equipment Cost	Operating Costs
Incinerator	$10,000-15,000	$1.50/100 Gallons
Deep Well	$10 to $30 per foot of depth	$2 - 2.50/1000 Gallons
Lagoons & Ponds	up to $5,000/acre	2 cents to 10 cents per pound BOD per day
Sewerage System (Municipal)	$400 to $1,500 /acre	$172/1000 Gallons
Sea Disposal	$1,100,000 (Barge Cost)	50 cents/ton (bulk) $2.50/1000 Gallons $24/ton (Containerized)
Centrifuge	$2200	
Evaporator (Fume Hood)	$850-$1250	
- Sanitary Land Fill - Small Operation - Large Operation		$2 - $5/ton $0.75 - $2.50/ton
Ion Exchange	$8000-$34,000	$1.10/1000 Gallons
Filtration (RO)	$36,000	1.70/1000 Gallons
Professional Chemical Disposal Company	$2,000,000	$0.05 - $0.60/Gallon

Source: Personal Communications with Manufacturers

COSTS FOR SOLVENT RECLAMATION STILLS

Solvent	Equipment Costs	Operating Costs
Carbon Tetrochlcride Tetrachloroethylene	$3273.00	\$.01 - \$.03/Gallon
Behzene Stoddard Solvent Acetone Methahol	$11,940.00	Under $0.01/Gallon
Mineral Spirits Light Oils	$9,620.00	Under $0.01/Gallon

Source: Personal Communication with Manufacturers.

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APPENDIX F

SUMMARY OF CONTACTS ESTABLISHED

One step of the study methodology included telephone and letter contacts to manufacturers of packaging and waste disposal equipment and to technical societies and trade associations. A copy of the form letter is shown on pages F(2) and F(3).

The contacts were made to increase and update an existing technical data base on packaging materials and waste disposal equipment. The types of information acquired included:

- Capacities of waste equipment and systems
- Number of waste treatment units produced and operating
- Types of waste materials compatible with the equipment
- Economic data concerning initial investment and operating costs.

The summary tables that begin on page F(4) indicate the total list of organizations contacted. The tables also indicate whether or not a response was received.

SUMMARY OF CONTACTS ESTABLISHED

COMPANY/ORGANIZATION	MEDIUM		RESPONSE	
	LETTER	TELEPHONE	YES	NO
AERONCA, INC., ENVIRONMENTAL CONTROL GROUP 200 RODNEY STREET PINEVILLE, NORTH CAROLINA 28134	X			
ALUMINUM FOIL CONTAINER MANUFACTURER'S ASSOCIATION P.O. BOX D FONTANA, WISCONSIN 53125 (414) 275-6838		X	X	
AMERICAN BUREAU OF METAL STATISTICS 50 BROADWAY NEW YORK, NEW YORK 10004 (212) 944-1870		X	X	
AMERICAN CHEMICAL SOCIETY 1155 SIXTEENTH STREET, N.W. WASHINGTON, D.C. 20036 (202) RE 7-3337		X	X	
AMERICAN IRON AND STEEL INSTITUTE 150 EAST 42ND STREET NEW YORK, NEW YORK 10017 (212) OX 7-5900		X	X	
AMERICAN PAPER INSTITUTE 260 MADISON AVENUE NEW YORK, NEW YORK 10016 (212) 889-6200		X	X	
AMERICAN SOCIETY OF MECHANICAL ENGINEERS 345 EAST 47TH STREET NEW YORK, NEW YORK (212) PL 2-6800		X	X	
AMERICAN SOCIETY FOR TESTING AND MATERIALS 1916 RACE STREET PHILADELPHIA, PENNSYLVANIA (215) LO 9-4200	X	X	X	
AMERICAN TEXTILE MANUFACTURER'S INSTITUTE 1150 17TH STREET, N.W. WASHINGTON, D.C. (202) 833-9420		X	X	

COMPANY/ORGANIZATION	MEDIUM		RESPONSE	
	LETTER	TELEPHONE	YES	NO
ANDCO ENVIRONMENTAL PROCESSES, INC. 51 ANDERSON ROAD BUFFALO, NEW YORK 14225 (716) 869-8181	X			
ANTEK INSTRUMENTS, INC. 6005 NORTH FREEWAY HOUSTON, TEXAS 77022 (713) 691-2265	X			
THE BAHNSON COMPANY BOX 10458, SALEM STATION WINSTON-SALEM, NORTH CAROLINA 27108 (919) 724-1581	X		X	
BARCLAY & COMPANY, INC. 500 SANSOME STREET SAN FRANCISCO, CALIFORNIA 94111 (415) 981-1720	X			
BARNES ENGINEERING COMPANY 30 COMMERCE ROAD STAMFORD, CONNECTICUT 06902 (203) 348-5381	X			
BARTLETT-SNOW 6200 HARVARD AVENUE CLEVELAND, OHIO 44105 (216) 883-5700	X			
BEAUMONT BIRCH COMPANY 1505 RACE STREET PHILADELPHIA, PENNSYLVANIA 19102 (215) 564-3570	X			
BELOIT CORPORATION, JONES DIVISION 401 SOUTH STREET DALTON, MASSACHUSETTS (413) 443-5621	X			
BELTRAN ASSOCIATES, INC. 1133 EAST 35TH STREET BROOKLYN, NEW YORK 11210 (212) 338-3311	X			
BIGELOW-LIPTAK CORPORATION NORTHWESTERN HIGHWAY & 10 MILE ROAD SOUTHFIELD, MICHIGAN 48076 (313) 353-5400	X			

COMPANY/ORGANIZATION	MEDIUM		RESPONSE	
	LETTER	TELEPHONE	YES	NO
THE BLACK CLAWSON COMPANY 605 CLARK STREET MIDDLETOWN, OHIO 45042 (513) 422-4561	X		X	
BRULE INCINERATOR CORPORATION 13920 S. WESTERN AVENUE BLUE ISLAND, ILLINOIS 60406 (312) 388-7900	X			
BUREAU OF DOMESTIC COMMERCE FOREST PRODUCTS, PACKAGING, PRINTING AND PUBLISHING DIV. 14TH STREET (BETWEEN CONSTITUTION AVE. & E ST., N.W.) WASHINGTON, D.C. 20230 (20[illegible]) 783-3962		X	X	
CALCINATOR CORPORATION 28TH & WATER STREETS BAY CITY, MICHIGAN 48706 (517) 894-4543	X		X	
CAN MANUFACTURER'S INSTITUTE 821 15TH STREET, N.W. WASHINGTON, D.C. 20005		X	X	
C-E AIR PREHEATER SUB. OF COMBUSTION ENGINEERING, INC. WELLSVILLE, NEW YORK 14895 (716) 593-2700	X		X	
C-E BAUER, BURT & SHERIDAN SPRINGFIELD, OHIO 45501 (513) 323-5501	X			
C-E RAYMOND/BARTLETT-SNOW 427 W. RANDOLPH STREET CHICAGO, ILLINOIS 60606 (312) 236-4044	X		X	
CERTAIN-TEED PRODUCTS CORPORATION VALLEY FORGE, PENNSYLVANIA 19481 (215) 68[illegible]-6000	X			
CERTIFIED INCINERATOR COMPANY 14006 VENTURA BOULEVARD SHERMAN OAKS, CALIFORNIA 91403 (213) 784-4424	X			

COMPANY/ORGANIZATION	MEDIUM		RESPONSE	
	LETTER	TELEPHONE	YES	NO
CHEMEC PROCESS SYSTEMS, INC. 501 ROUTE 303 TAPPAN, NEW YORK 10983 (914) 359-3008	X			
CHEMICAL DATA SYSTEMS, INC. RD. 2, P.O. BOX 74 OXFORD, PENNSYLVANIA 19363 (215) 932-3636	X		X	
CHROMALYTICS CORPORATION ROUTE 82 UNIONVILLE, PENNSYLVANIA 19375 (215) 347-2454	X			
CLAW WASTE TREATMENT DIVISION P.O. BOX 324, 56 INDUSTRIAL ROAD FLORENCE, KENTUCKY 41042 (606) 283-2121	X			
CLOW CORPORATION EXECUTIVE PLAZA EAST 1211 W. 22ND STREET OAK BROOK, ILLINOIS 60521 (312) 325-6000	X			
COEN COMPANY 1510 ROLLINS ROAD BURLINGAME, CALIFORNIA 49010 (415) 697-0440	X		X	
COMBUSTION ENGINEERING, INC. 1000 PROSPECT HILL ROAD WINDSOR, CONNECTICUT 06095 (203) 688-1911	X		X	
COMBUSTION POWER COMPANY, INC. 1346 WILLOW ROAD MENLO PARK, CALIFORNIA 94025 (415) 324-4744	X		X	
COMPAKTION ENGINEERING P.O. BOX 248 TAMIARNI STATION MIAMI, FLORIDA 33144 (305) 887-8277	X			
COMPOSITE CAN AND TUBE INSTITUTE 1725 EYE STREET, N.W. WASHINGTON, D.C. 20006		X	X	

COMPANY/ORGANIZATION	MEDIUM		RESPONSE	
	LETTER	TELEPHONE	YES	NO
DESPATCH OVEN COMPANY P.O. BOX 1320 MINNEAPOLIS, MINNESOTA 55440 (612) 331-1873	X			
M.H. DETRICK COMPANY 20 NORTH WACKER DRIVE CHICAGO, ILLINOIS 60606 (312) 726-6974	X		X	
DETROIT STOKER COMPANY 1510 E. FIRST STREET MONROE, MICHIGAN 48161 (313) CHI-9500	X		X	
DORR-OLIVER, INC. 77 HAVEMEYER LANE STAMFORD, CONNECTICUT 06904 (203) 348-5871	X		X	
ECOLOGICAL SCIENCE CORPORATION 20215 N.W. SECOND AVENUE MIAMI, FLORIDA 33169 (305) 624-9601	X			
ECOLOTROL, INC. 1211 STEWARD AVENUE BETHPAGE, NEW YORK 11714 (516) 938-6622	X			
EIDAL INTERNATIONAL CORPORATION 245 WOODWARD ROAD, S.E., P.O. BOX 2087 ALBUQUERQUE, NEW MEXICO 87103 (505) 243-1341	X			
ENERGEX, LTD. 7998 MIRAMAR ROAD SAN DIEGO, CALIFORNIA 92126 (714) 271-4880	X			
ENVIRONISTICS, DIV. OF INSTRUMENT SYSTEMS CORP. 410 JERICO TURNPIKE JERICO, NEW YORK 11753 (516) 822-4200	X			
ENVIRONMENTAL SCIENCES, INC. 2901 BANKSVILLE ROAD PITTSBURGH, PENNSYLVANIA 15216 (412) 343-8800	X			

COMPANY/ORGANIZATION	MEDIUM		RESPONSE	
	LETTER	TELEPHONE	YES	NO
ENVIRONMENTAL SERVICES, INC. GRANITE & WEST STREETS MIDLAND PARK NEW JERSEY 07432 (201) 652-3332	X		X	
ENVIRONMENTAL SERVICES, INC. 433 LIBERTY STREET LITTLE FERRY, NEW JERSEY 07643 (201) 488-0200	X			
ENVIROTECH CORPORATION 3000 SAND HILL ROAD MENLO PARK, CALIFORNIA 94025 (415) 854-2000	X			
E.T.D. OF AQUA CHEM, INC. 3707 N. RICHARDS STREET MILWAUKEE, WISCONSIN 53217 (414) 962-0100	X			
FALCON PRODUCTS, INC. P.O. BOX 331-ES, 49 E. 2ND STREET HIALEAH, FLORIDA 33011 (305) 885-1193	X			
FIBER BOX ASSOCIATION 224 SOUTH MICHIGAN AVENUE CHICAGO, ILLINOIS 60604 (312) 663-0250		X	X	
FMC CORPORATION, ENVIRONMENTAL EQUIPMENT DIVISION 2240 W. DIVERSEY AVENUE CHICAGO, ILLINOIS 60647 (312) 227-7000	X		X	
GARVER-DAVIS, INC. 653 ALPHA PARK DRIVE HIGHLAND HEIGHTS OHIO 44143 (216) 531-0836	X			
GENERAL SERVICES ADMINISTRATION PACKAGING & PACKING BRANCH, STANDARDIZATION DIV. WASHINGTON, D.C. 20406		X	X	
GLASS CONTAINER INDUSTRY RESEARCH CORPORATION 444 EAST COLLEGE AVENUE STATE COLLEGE, PENNSYLVANIA 16801 (814) 237-5751		X	X	
GLASS CONTAINER MANUFACTURER'S INSTITUTE 330 MADISON AVENUE NEW YORK, NEW YORK 10017 (212) 682-5533		X	X	

COMPANY/ORGANIZATION	MEDIUM		RESPONSE	
	LETTER	TELEPHONE	YES	NO
JOSEPH GODER, INC. 2483 GREENLEAF AVENUE ELK GROVE VILLAGE, ILLINOIS 60007 (312) 439-5700	X			
GRUENDLER CRUSHER & PULVERIZER COMPANY 2915 N. MARKET STREET ST. LOUIS, MISSOURI 63106 (314) 531-1220	X		X	
GULF STATES POLLUTION CONTROL, INC. HIGHWAY 79 WEST JACKSONVILLE, TEXAS 75766 (214) 586-2408	X			
HAMILTON COMPANY 12440 E. LAMBERT ROAD WHITTIER, CALIFORNIA 90606 (213) 698-0751	X			
THE HEIL COMPANY 3000 W. MONTANA STREET MILWAUKEE, WISCONSIN 53201 (414) 647-3300	X		X	
HUDSON VALLEY COMPACTOR CORPORATION BOX 391 NEW CITY, NEW YORK 10956 (212) 244-3899	X			
INCINERATOR INTERNATIONAL, INC. 2702 N. MAIN STREET P.O. BOX 8617 HOUSTON, TEXAS 77009 (713) 227-1466	X			
INSTITUTE OF PAPER CHEMISTRY 1043 EAST SOUTH RIVER STREET APPLETON, WISCONSIN 54911 (414) 734-9251		X	X	
JEFFREY MANUFACTURING COMPANY P.O. BOX 1879 COLUMBUS, OHIO 43216 (614) 421-3123	X		X	
KLENZ-AIRE, INC. P.O. BOX 59326 LOUISVILLE, KENTUCKY 40299 (502) 267-1783	X			

COMPANY/ORGANIZATION	MEDIUM		RESPONSE	
	LETTER	TELEPHONE	YES	NO
LOMBARD CORPORATION 630 WICK AVENUE YOUNGSTOWN, OHIO 44501 (216) 747-3535	X			
MANUFACTURING CHEMISTS ASSOCIATION 1825 CONNECTICUT AVENUE, N.W. WASHINGTON, D.C. 20009		X	X	
MARATHON EQUIPMENT COMPANY, INC 1312 BORDEN AVENUE LEEDS, ALABAMA 35094	X		X	
MARENE ENGINEERING CORPORATION 111 W. 166TH STREET SOUTH HOLLAND, ILLINOIS 60473 (312) 333-6250	X			
MAXON CORPORATION 201 E. 18TH STREET MUNCIE, INDIANA 47302 (317) 284-3304	X		X	
McNAULIN INCINERATORS, INC. P.O. BOX 634 BUTLER, WISCONSIN 53007 (414) 781-3680	X			
MIDLAND-ROSS CORPORATION P.O. BOX 490 ROXBORO, NORTH CAROLINA 27573	X			
MIDLAND-ROSS CORPORATION, SURFACE COMBUSTION DIV. 2375 DORR STREET TOLEDO, OHIO 43601 (419) 536-4611	X			
FRANKLIN MILLER, INC. 36 MEADOW STREET EAST ORANGE, NEW JERSEY 07017 (201) 673-5550	X		X	
MIL-PAC SYSTEMS, INC. 900 NORTH AVENUE P.O. BOX 2791 PLAINFIELD, NEW JERSEY 07062 (201) 561-4?00	X			

COMPANY/ORGANIZATION	MEDIUM		RESPONSE	
	LETTER	TELEPHONE	YES	NO
MITCHELL & ASSOCIATES, INC. P.O. BOX 5345 EVANSVILLE, INDIANA 47715 (812) 477-2381	X			
MONSANTO ENVIRO-CHEM SYSTEMS, INC. 10 S. RIVERSIDE PLAZA CHICAGO, ILLINOIS 60606 (312) 782-5041	X			
MORSE BOULGER, INC. 53-09 97TH PLACE CORONA, NEW YORK 11368 (212) 699-5000	X		X	
MSI INDUSTRIES, INC. BOX 16067 3800 RACE STREET DENVER, COLORADO 80216 (303) 244-4353	X			
MUNICIPAL EQUIPMENT, DIV. OF ENVIROTECH 100 VALLEY DRIVE BRISBANE, CALIFORNIA 94005 (415) 467-3800	X			
NATIONAL AIROIL BURNER COMPANY 1284 SEDGLEY AVENUE PHILADELPHIA, PENNSYLVANIA 19134 (215) 743-5300	X		X	
NATIONAL ASSOCIATION OF SECONDARY MATERIAL INDUSTRIES 330 MADISON AVENUE NEW YORK, NEW YORK 10017		X	X	
NATIONAL BUREAU OF STANDARDS GAITHERSBURG, MARYLAND (301) 921-3246		X	X	
NATIONAL CENTER FOR RESOURCE RECOVERY 1211 CONNECTICUT AVENUE, N.W. WASHINGTON, D.C. 20036 (202) 223-6154		X	X	
NATIONAL COMPACTOR & TECHNOLOGY SYSTEMS, INC. 5400 RIO GRANDE AVENUE JACKSONVILLE, FLORIDA 32205	X		X	

COMPANY/ORGANIZATION	MEDIUM		RESPONSE	
	LETTER	TELEPHONE	YES	ON
NATIONAL INCINERATOR CORPORATION 1500 S. WESTERN AVENUE CHICAGO, ILLINOIS 60608 (312) 733-5500	X			
NICHOLS ENGINEERING & RESEARCH CORPORATION 150 WILLIAM STREET NEW YORK, NEW YORK 10038 (212) 964-9500	X			
NORTH AMERICAN MANUFACTURING COMPANY 4455 E. 71ST STREET CLEVELAND, OHIO 44105 (216) 271-6000	X			
NORTHEAST BURN-ZOL CORPORATION BOX 109 DOVER, NEW JERSEY 07801 (201) 361-5900	X			
THE O'MAC COMPANY, INC. 3530 PETERSON AVENUE CHICAGO, ILLINOIS 60645	X			
ORGONICS, INC. P.O. BOX 543 SLATERSVILLE, RHODE ISLAND 02876 (401) 766-3530	X			
PACKAGING INSTITUTE 342 MADISON AVENUE NEW YORK, NEW YORK 10017 (212) MU 7-8875	X	X	X	
PAPERBOARD PACKAGING COUNCIL 1250 CONNECTICUT AVENUE, N.W. WASHINGTON, D.C. 20036 (202) 872-0180		X	X	
PLYWOOD RESEARCH FOUNDATION 1119 A STREET TACOMA, WASHINGTON 98401 (206) BR 2-2283		X	X	
POLLUTION SOLUTIONS, INC. 14225 VENTURA BOULEVARD SHERMAN OAKS, CALIFORNIA 91403 (213) 981-7107	X			

COMPANY/ORGANIZATION	MEDIUM		RESPONSE	
	LETTER	TELEPHONE	YES	NO
PRENCO MANUFACTURING COMPANY, PICKANDS MATHER & CO. 700 PENOBSCOT BUILDING DETROIT, MICHIGAN 48226 (313) 962-1560	X			
PRENCO MANUFACTURING COMPANY 29800 STEPHENSON HIGHWAY MADISON HEIGHTS, MICHIGAN 48071 (313) 549-2700	X			
PROCEDYNE CORPORATION 221 SOMERSET STREET N. BRUNSWICK, NEW JERSEY 08903 (201) 249-8347	X			
PYRO INDUSTRIES, INC. 38 WINDSOR AVENUE MINEOLA, NEW YORK 11501 (516) 747-4490	X			
RECLAMATION SYSTEMS INC. P.O. BOX 29 CAMBRIDGE, MASSACHUSETTS 02141 (617) 742-8147	X			
REES-MEMPHIS, INC. P.O. BOX 225 MEMPHIS, TENNESSEE 38103 (901) 527-4443	X		X	
RESEARCH & DEVELOPMENT ASSOCIATES FOR MILITARY FOOD & PACKAGING SYSTEMS 90 CHURCH STREET NEW YORK, NEW YORK 10007 (212) 483-8945		X	X	
REX CHAINBELT, INC. P.O. BOX 2022 MILWAUKEE, WISCONSIN 53201 (414) 384-3000	X		X	
REYNOLDS METALS 6601 WEST BROAD STREET RICHMOND, VIRGINIA 23261 (804) 282-2311	X	X	X	
JUDD RINGER CORPORATION 6860 FLYING CLOUD DRIVE EDEN PRAIRIE, MINNESOTA 55343 (312) 941-4180	X			

COMPANY/ORGANIZATION	MEDIUM		RESPONSE	
	LETTER	TELEPHONE	YES	NO
SURFACE COMBUSTION, DIV. OF MIDLAND-ROSS CORP. 2375 DORR STREET P.O. BOX 907 TOLEDO, OHIO 43601 (419) 536-4611	X		X	
SYSTEMS ENGINEERING & MANUFACTURING COMPANY, INC. 6330 WASHINGTON AVENUE P.O. BOX 7634 HOUSTON, TEXAS 77007 (713) 869-3583	X		X	
TAILOR & COMPANY, INC. 2403 STATE STREET BETTENDORF, IOWA 52722 (319) 355-2621	X			
TAKUMA COMPANY, LTD. 16 DOJIMA NAKAI KITA-KU OSAKA, JAPAN (06) 346-5161	X			
TECHNICAL ASSOCIATION OF THE PULP & PAPER INDUSTRY 1 DUNWOODY PARK ATLANTA, GEORGIA 30341 (404) 457-6352		X	X	
TEKOLOGY CORPORATION BERGEN & EDSALL BOULEVARDS PALISADES PARK, NEW JERSEY 07650 (201) 944-2221	X			
TEXTILE BAG MANUFACTURER'S ASSOCIATION 518 DAVIS STREET EVANSTON, ILLINOIS 60201 (312) 328-3339		X	X	
THERMAL RESEARCH & ENGINEERING CORPORATION ACORDON INTERNATIONAL COMPANY BROOK ROAD CONSHOHOCKEN, PENNSYLVANIA 19428 (215) 828-5400	X		X	
THERMAL ELECTRIC COMPANY, INC. 109 FIFTH STREET SADDLE BROOK, NEW JERSEY 07662 (201) 843-5800	X			

COMPANY/ORGANIZATION	MEDIUM		RESPONSE	
	LETTER	TELEPHONE	YES	NO
TUBAR WASTE SYSTEMS, DIVISION OF UHRDEN, INC. SUGARCREEK, OHIO 44681	X			
UNION CARBIDE CORPORATION, LINDE DIVISION 270 PARK AVENUE NEW YORK, NEW YORK 10017 (212) 551-2345	X			
THE UNITED CORPORATION 1947 N. TOPEKA BOULEVARD TOPEKA, KANSAS 66608 (913) 234-5603	X			
U.S. ENVIRONMENTAL PROTECTION AGENCY OFFICE OF SOLID WASTE MANAGEMENT PROGRAMS 1835 K STREET, N.W. WASHINGTON, D.C. 254-7400		X	X	
VOLAND CORPORATION 27 CENTRE AVENUE NEW ROCHELLE, NEW YORK 10802 (914) 636-2014	X			
WARNER COMPANY 1721 ARCH STREET PHILADELPHIA, PENNSYLVANIA 19103 (215) LO 3-3900	X			
WASTE COMBUSTION CORPORATION 5824 MEADOWBRIDGE ROAD MECHANICSVILLE, VIRGINIA 23111 (703) 746-5264	X			
WASTE CONTROL SYSTEMS, INC. P.O. BOX 22916 HOUSTON, TEXAS 77027 (713) 866-2691	X			
WASTECO, INC. 20675 S.W. 105TH STREET TUALATIN OREGON 97216 (503) 638-6851	X			
WEBSTER MANUFACTURING COMPANY W. HALL STREET TIFFIN, OHIO 44883 (419) 447-8232	X			

COMPANY/ORGANIZATION	MEDIUM		RESPONSE	
	LETTER	TELEPHONE	YES	NO
WILLIAMS PATENT CRUSHES & PULVERIZER COMPANY 2701 N. BROADWAY ST. LOUIS, MISSOURI 63102 (314) 621-3348	X		X	
WIREBOUND BOX MANUFACTURERS ASSOCIATION 1211 WEST 22ND STREET OAK BROOK, ILLINOIS 60521 (302) 654-3020		X	X	
WYSSMONT COMPANY, INC. 1476 BERGEN BOULEVARD FORT LEE, NEW JERSEY 07024 (201) 947-4600	X			
ZIMPRO, INC., SUB. OF STERLING DRUG, INC. ROTHSCHILD, WISCONSIN 54474 (715) 359-3166	X			
JOHN ZINK COMPANY, POLLUTION RESEARCH DIVISION 4401 S. PEORIA TULSA, OKLAHOMA 74105 (917) 747-1371	X			
ZURN INDUSTRIES, INC., SWARTWOUT DIVISION 1000 N. TOUBY PIKE KOKOMO, INDIANA 46901 (317) 459-5151	X			
ZURN INDUSTRIES, INC. 1801 PITTSBURGH AVENUE ERIE, PENNSYLVANIA 16512 (814) 455-0921	X			
ZURN INDUSTRIES, INC., SARGENT INCINERATOR DIV. 610 DEVON STREET KEARNY, NEW JERSEY 07032 (201) 991-7200	X		X	

APPENDIX G

GLOSSARY

AERATION - The process of exposing a bulk material, such as compost, to air, or of charging a liquid with a gas or a mixture of gases.

AEROBIC - Able to live and grow only if free oxygen is present.

AFTERBURNER - A device used to burn or oxidize the combustible constituents remaining in the effluent gases.

AIR

Ambient - The surrounding air.

Combustion - Air used for burning a fuel.

Cooling - Ambient air that is added to hot combustion gases to cool them.

Excess Combustion - Air supplied in excess of theoretical air, usually expressed as a percentage of the theoretical air.

Primary Combustion - Air admitted to a combustion system at the point where the fuel is first oxidized.

Secondary Combustion - Air introduced above or beyond a fuel bed by a natural, induced, or forced draft. It is generally referred to as overfire air if supplied above the fuel bed through the side walls or the bridge wall of the primary chamber.

Theoretical - The amount of air, calculated from the chemical composition of a waste, that is required to completely burn the waste. Also referred to as stoichiometric air and theoretical combustion air.

AIR POLLUTANT - A substance that, when present in the atmosphere in large enough concentrations, adversely affects the environment.

AIR POLLUTION - An impaired condition of the atmosphere that results because certain substances present in it are too numerous or are of a noxious character.

AIR QUALITY STANDARDS - Levels below which a specific substance or combination of substances must be kept in the atmosphere as established by legislation.

ANAEROBIC - Able to live and grow in the absence of free oxygen.

AQUIFER - An underground, water-bearing geologic formation.

ASH - The incombustible material that remains after a fuel or solid waste has been burned.

ASH-FREE BASIS - The method whereby the weight of ash in a fuel sample is subtracted from its total weight and the adjusted weight is used to calculate the percent of certain constituents present. For example, the percent of fixed carbon (F C) on an ash-free basis is computed as follows:

$$\frac{\text{F C (weight)} \times 100}{\text{Fuel Sample (weight)} - \text{Ash (weight)}} = \text{\% ash-free F C}$$

ASH PIT - A pit or hopper located below a furnace where residue is accumulated and from which it is removed.

ASH SLUICE - A trench or channel in which water transports residue from an ash pit to a disposal or collection point.

BACKFILL - The material used to refill a ditch or other excavation, or the process of doing so.

BACTERIA - Single-cell, microscopic organisms, that possess rigid cell walls. They may be aerobic, anaerobic, or facultative; they can cause disease; and some are important in the stabilization of solid wastes.

BALER - A machine used to compress and bind solid waste or other materials.

BECCARI PROCESS - A composting process developed by Dr. Giovanni Beccari in 1922. Anaerobic fermentation is followed by a final stage in which decomposition proceeds under partially aerobic conditions; the process was later modified by Verdier and Bordas.

BIODEGRADABLE - The significant breaking down by microorganisms of the physical and/or chemical structure of a compound.

BLOWER - A fan used to force air or gas under pressure.

BOOSTER CYCLE - The period during which additional hydraulic pressure is exerted to push the last charge of solid waste into a transfer trailer or a container attached to a stationary compactor.

BRICK (FIREBRICK) - Refractory brick made from fireclay.

Alumina-Diaspore Fireclay - Brick consisting mainly of diaspore or nodule clay and having an alumina content of 50, 60, or 70 percent (plus or minus 2.5 percent).

High-Duty Fireclay - A fireclay brick that has a pyrometric cone equivalent (PCE) not lower than Cone 31-23, or does not deform more than 1.5 percent at 2,460 F (1,350 C) in the standard load test.

Insulating - A firebrick having a low thermal conductivity and a bulk density of less than 70 pounds per cubic foot; suitable for lining industrial furnaces. Also called insulating block.

Intermediate-Duty Fireclay - A fireclay brick that has a PCE above Cone 29 or does not deform more than 3 percent at 2,460 F (1,350 C) in the standard load test.

Super-Duty Fireclay - A fireclay brick that has a PCE above Cone 33 on the fired product, shrinks less than 1 percent in the American Society for Testing Materials permanent linear change test, Schedule C (2,910 F), and does not incur more than 4 percent loss in the panel spalling test (preheated to 3,000 F).

BRIQUETTER - A machine that compresses a material, such as metal turnings or coal dust, into small pellets.

BURNING AREA - The horizontal projection of a grate, a hearth, or both.

BURNING RATE - The quantity of solid waste incinerated or the amount of heat released during incineration. The rate is usually expressed in pounds of solid waste per square foot of burning area per hour or in Btu's per square foot of burning area per hour.

CAPACITY (INCINERATOR)

Design - The number of tons of solid waste that a designer anticipates his incinerator will be able to process in a 24-hour period if specified criteria are met.

Firm - The processing capacity of an incinerator when its largest independent unit is not operating.

Rated - The number of tons of solid waste that can be processed at an incinerator per 24-hour period when specified criteria prevail.

CARBON DIOXIDE (CO_2) - A colorless, odorless, non-poisonous gas that forms carbonic acid when dissolved in water; it is produced during the thermal degradation and microbial decomposition of solid wastes.

CARBON MONOXIDE (CO) - A colorless, poisonous gas that has an exceedingly faint metallic odor and taste. It is produced during the thermal degradation and microbial decomposition of solid wastes when the oxygen supply is limited.

CARBON NITROGEN RATIO (C/N) - The ratio of the weight of carbon to the weight of nitrogen present in a compost or in materials that are being composted.

CATALYTIC COMBUSTION SYSTEM - A process in which a substance is introduced into an exhaust gas stream to burn or oxidize vaporized hydrocarbons or odorous contaminants; the substance itself remains intact.

CELL - Compacted solid wastes that are enclosed by natural soil or cover material in a sanitary landfill.

CELL HEIGHT - The vertical distance between the top and bottom of the compacted solid waste enclosed by natural soil or cover material in a sanitary landfill.

CELL THICKNESS - The perpendicular distance between the cover materials placed over the last working faces of two successive cells in a sanitary landfill.

CHARGE - The quantity of solid waste introduced into a furnace at one time.

CHARGING CHUTE - An overhead passage through which waste materials drop into an incinerator.

CHIPPER - A size-reduction device having sharp blades attached to a rotating shaft (mandrel) that shave or chip off pieces of certain objects, such as tree branches or brush.

COLLECTION - The act of removing solid waste from the central storage point of a primary source.

Alley - The picking up of solid waste from containers placed adjacent to an alley.

Carryout - Crew collection of solid waste from an on-premise storage area using a carrying container, carry-cloth, or a mechanical method.

Contract - The collection of solid waste carried out in accordance with a written agreement in which the rights and duties of the contractual parties are set forth.

Curb - Collection of solid waste from containers placed adjacent to a thoroughfare.

Franchise - Collection made by a private firm that is given exclusive right to collect for a fee paid by customers in a specific territory or from specific types of customers.

Municipal - The collection of solid waste by public employees and equipment under the supervision and direction of a municipal department or official.

Private - The collection of solid waste by individuals or companies from residential, commercial, or industrial premises; the arrangements for the service are made directly between the owner or occupier of the premises and the collector.

Setout/Setback - The removal of full and the return of empty containers between the on-premise storage point and the curb by a collection crew.

COMBUSTION - The chemical combining of oxygen with a substance that results in the production of heat and usually light.

COMBUSTION GASES - The mixture of gases and vapors produced by combustion.

COMPACTION PIT TRANSFER SYSTEM - A transfer system in which solid waste is compacted in a storage pit by a crawler tractor before being pushed into an open-top transfer trailer.

COMPACTOR

Mobile - A vehicle with an enclosed body containing mechanical devices that convey solid waste into the main compartment of the body and compress it.

Sanitary Landfill - A vehicle equipped with a blade and with rubber tires sheathed in steel or hollow steel cores; both types of wheels are equipped with load concentrations to provide compaction and a crushing effect.

Stationary - A machine that reduces the volume of solid waste by forcing it into a container.

COMPOST - Relatively stable decomposed organic material.

COMPOSTING - A controlled process of degrading organic matter by microorganisms.

Mechanical - A method in which the compost is continuously and mechanically mixed and aerated.

Ventilated Cell - A composting method in which the compost is mixed and aerated by being dropped through a vertical series of ventilated cells.

Windrow - An open-air method in which compostable material is placed in windrows, piles, or ventilated bins or pits and is occasionally turned or mixed. The process may be anaerobic or aerobic.

COVER MATERIAL - Soil that is used to cover compacted solid waste in a sanitary landfill.

CULLET - Clean, color-sorted, crushed glass that is used in glassmaking to speed up the melting of silica sand.

DECOMPOSTION - The reduction of the net energy level and change in chemical composition of organic matter, as by microorganisms.

DENSITY

Sanitary Landfill - The ratio of the combined weight of solid waste and soil cover to the combined volume of the solid waste and the soil cover. $(W_{SW} + W_{soil}/V_{SW} + V_{soil})$

Bulk or Solid Waste - The number obtained by dividing the weight of solid waste by its volume.

DESTRUCTIVE DISTILLATION - The airless heating of organic matter that results in the evolution of volatile substances and produces a solid char consisting of fixed carbon and ash. *See* **LANTZ PROCESS**

DISPOSAL

Ocean - The deposition of waste into an ocean or estuarine body of water.

On-Site - The utilization of methods or processes to eliminate or reduce the volume or weight of solid waste on the property of the generator.

Waste - The orderly process of discarding useless or unwanted material.

DUMP - A land site where solid waste is disposed of in a manner that does not protect the environment.

DUMPING - An indiscriminate method of disposing of solid waste. Meaning the unloading or emptying of a container: use *discharging.*

DUST - Fine-grain particulate matter that is capable of being suspended in air.

ECOLOGY - The science that deals with the interrelationships of organisms and their living and non-living surroundings.

ECOSYSTEM - The interdependence of organisms and their surroundings.

EFFLUENT - The substances that flow out of a designated source.

EFFLUENT SEEPAGE - Diffuse discharge onto the ground of liquids that have percolated through solid waste or another medium; they contain dissolved or suspended materials.

EMISSIONS - Material that is released into the air either by a discrete source (primary emission) or as the result of a photochemical reaction or chain of reactions (secondary emission).

EMISSION STANDARD - A rule or measurement established to regulate or control the amount of a given pollutant that may be discharged into the outdoor atmosphere from its source.

ENVIRONMENT - The conditions, circumstances, and influences surrounding and affecting the development of an organism or group of organisms.

ENVIRONMENTAL SYSTEM - The interraction of an organism or group of organisms with its natural and manmade surroundings.

FACULTATIVE - Able to live and grow with or without free oxygen.

FAIRFIELD-HARDY DIGESTER (COMPOSTING) - A patented product of Fairfield Engineering Company, Marion, Ohio, which decomposes garbage, sewage sludge, industrial, and other organic wastes by a controlled continuous aerobic-thermophilic process.

FIELD CAPACITY (OF SOLID WASTE) - The amount of water retained in solid waste after it has been saturated and has drained freely. Also known as moisture-holding capacity.

FLUE - Any passage designed to carry combustion gases and entrained particulates.

FLUE DUST - Solid particles (smaller than 100 microns) carried in the products of combustion.

FLUE GAS - Waste gas from a combustion process.

FLUE GAS SCRUBBER OR WASHER - A type of equipment that removes fly ash and other objectionable materials from flue gas by the use of sprays, wet baffles, or other means that require water as the primary separation mechanism.

FLUIDIZED BED TECHNIQUE - A combustion process in which heat is transferred from finely divided particles, such as sand, to combustible materials in a combustion chamber. The materials are supported and fluidized by a column of moving air.

FLY ASH - All solids, including ash, charred paper, cinders, dust, soot, or other partially incinerated matter, that are carried in a gas stream.

FUEL BED - The layer of solid fuel or solid waste on a furnace grate or hearth.

FUME - Suspended particles in a gas; one micron or less in diameter.

FUNGI - Simple plants that lack a photosynthetic pigment. The individual cells have a nucleus surrounded by a membrane, and they may be linked together in long filaments called hyphae, which may grow together to form a visible body. Simpler fungi are involved in the stabilization of solid waste and sewage.

FURNACE - The chambers of an incinerator where drying, ignition, and combustion occur.

GASIFICATION - The process of converting a solid or liquid fuel into a gaseous fuel.

GENERATION - The act or process of producing solid waste.

GRADER - A gas- or diesel-powered, pneumatic-wheeled machine equipped with a centrally located blade that can be angled to cast to either side.

GRATE - A device used to support the solid fuel or solid waste in a furnace during drying, ignition, or combustion. Openings in it permit air to pass through it.

GROUNDWATER - Water present in the saturated zone of an aquifer.

Free - Groundwater in aquifers that are not bounded by or confined in impervious strata.

GROUNDWATER RUNOFF - That part of the groundwater that is discharged into a stream channel as spring or seepage water.

HAMMERMILL - A broad category of high-speed equipment that uses pivoted or fixed hammers or cutters to crush, grind, chip, or shred solid wastes.

HEAT OF COMBUSTION - The heat released, measured in Btu's, when a unit quantity of waste or fuel is burned.

HEAT RELEASE RATE - The amount of heat liberated during complete combustion; it is usually expressed in Btu's per hour per cubic foot of the internal volume of the furnace where the combustion takes place.

HEAT VALUE

High - The Btu's liberated when a pound of solid waste is burned completely and the products of combustion are cooled to the initial temperature of the solid waste, as in a calorimeter.

Low - The high heat value minus the latent heat of vaporization of the water that is formed by burning the hydrogen in the fuel.

HYDROGEN SULFIDE (H_2S) - A poisonous gas with the odor of rotten eggs that is produced from the reduction of sulfates in and the putrefaction of a sulfur-containing organic material.

IGNITION TEMPERATURE - Lowest temperature of a fuel at which combustion becomes self-sustaining.

IMPACT MILL - A machine that grinds material by throwing it against heavy metal projections rigidly attached to a rapidly rotating shaft.

INCINERATION - The controlled process by which solid, liquid, or gaseous combustible wastes are burned and changed into gases and the residue produced contains little or no combustible material.

INCINERATOR - An engineered apparatus used to burn waste substances and in which all the factors of combustion—temperature, retention time, turbulence, and combustion air—can be controlled.

Batch Fed - An incinerator that is periodically charged with solid waste; one charge is allowed to burn down or burn out before another is added.

Cell-type - An incinerator whose grate areas are divided into cells, each of which has its own ash drop, underfire air control, and ash grate.

Central - A conveniently located facility that burns solid waste collected from many different sources.

Chute Fed - An incinerator that is charged through a chute that extends two or more floors above it.

Continuous Feed - An incinerator into which solid waste is charged almost continuously to maintain a steady rate of burning.

Controlled-Air - An incinerator with two or more combustion areas in which the amounts and distribution of air are controlled. Partial combustion takes place in the first zone, and gases are burned in a subsequent zone or zones.

Direct Fed - An incinerator that accepts solid waste directly into its combustion chamber.

Flue Fed - An incinerator that is charged through a shaft that functions as a chute for charging waste and has a flue to carry the products of combustion.

Industrial - An incinerator designed to burn a particular industrial waste.

Multiple Chamber - An incinerator consisting of two or more chambers, arranged as in-line or retort types, interconnected by gas passage ports or ducts.

Municipal - A privately or publicly owned incinerator primarily designed and used to burn residential and commercial solid wastes.

On-Site - An incincerator that burns solid waste on the property utilized by the generator thereof.

Open Pit - A burning device that has an open top and a system of closely spaced nozzles that place a stream of high-velocity air over the burning zone.

Retort-type - A multiple-chamber incinerator in which the gases travel from the end of the ignition chamber, then pass through the mixing and combustion chamber.

INDORE PROCESS - An anaerobic composting method that originated in India; it is similar to the Bangalore process and was modified by Van Maanen. Organic wastes are placed in alternate layers with human or animal excreta in a pit or pile. The piles are turned twice in six months and drainage is used to keep the compost moist.

INOCULUM - Microorganisms placed in a culture medium, soil, compost, etc.

LANTZ PROCESS - A destructive distillation technique, in which the combustible components of solid waste are converted into combustible gases, charcoal, and a variety of distillates.

LEACHATE - Liquid that has percolated through solid waste or other medium and has extracted dissolved or suspended materials from it.

LITTER - Wantonly discarded material.

METALS - In the secondary materials industry, metals include all ferrous, nonferrous, and alloy materials.

METHANE (CH_4) - An odorless, colorless, and asphyxiating gas that can explode under certain circumstances; can be produced by solid waste undergoing anaerobic decomposition.

MILLED REFUSE - Solid waste that has been mechanically reduced in size.

ODOR THRESHOLD - The lowest concentration of an airborne odor that a human can detect.

OPEN BURNING - Uncontrolled burning of wastes in the open or in an open dump.

ORGANISM - Any living thing.

Microorganism - Any living thing that is microscopic or submicroscopic in size.

PATHOGEN - An organism capable of producing disease.

PERCENT MOISTURE CONTENT (SOLID WASTE) - The percent of moisture contained in solid waste; it can be calculated on a dry or wet basis.

1. $$\text{Wet} = \frac{100\ (\text{water content of sample})}{\text{Dry weight of sample \& water content of sample}}$$

2. $$\text{Dry} = \frac{100\ (\text{water content of sample})}{\text{Dry weight of sample}}$$

PERMEABILITY - The capacity of a porous medium to conduct or transmit fluids.

PICKING TABLE OR BELT - Table or belt on which solid waste is manually sorted and certain items are removed. It is normally used in composting and salvage operations.

POLLUTION - The condition caused by the presence in the environment of substances of such character and in such quantities that the quality of the environment is impaired or rendered offensive to life.

PROCESSING - Any method, system, or other treatment designed to change the physical form or chemical content of solid waste.

PRODUCTS OF COMBUSTION - The gases, vapors, and solids that result from the combustion of a fuel.

PULVERIZATION - The crushing or grinding of material into small pieces.

PUTREFACTION - The decomposition of organic matter by microorganisms and oxidation, resulting in odors.

PUTRESCIBLE - Organic matter capable of being decomposed by microorganisms.

PYROLYSIS - The chemical decomposition of a material by heat in the absence of oxygen.

RASPER - A grinding machine in the form of a large vertical drum containing heavy hinged arms that rotate horizontally over a rasp-and-sieve floor.

RECLAMATION - The restoration to a better or more useful state, such as land reclamation by sanitary landfilling, or the obtaining of useful materials from solid waste.

RECOVERABLE RESOURCES - Materials that still have usefull physical or chemical properties after serving a specific purpose and can, therefore, be reused or recycled for the same or other purposes.

RECOVERY - The process of obtaining materials or energy resources from solid waste. Synonyms: Extraction, Reclamation, Salvage.

Energy Energy available from the heat generated when solid wastes are incinerated.

RECYCLING - The process by which waste materials are transformed into new products in such a manner that the original products may lose their identity.

REFUSE *See* **SOLID WASTE.**

REPROCESSING - The action of changing the condition of a secondary material.

RESIDUE - Material that remains after gases, liquids, or solids have been removed.

Incinerator Residue All of the solid material collected after an incineration process is completed.

REUSE - The reintroduction of a commodity into the economic stream without any change.

RUBBISH - A general term for solid waste—excluding food waste and ashes—taken from residences, commercial establishments, and institutions.

SALVAGE - The utilization of waste materials.

SALVAGING - The controlled removal of waste materials for utilization.

SANITARY LANDFILL - A site where solid waste is disposed using sanitary landfilling techniques.

SANITARY LANDFILLING - An engineered method of disposing of solid waste on land in a manner that protects the environment, by spreading the waste in thin layers, compacting it to the smallest practical volume, and covering it with soil by the end of each working day.

SANITARY LANDFILLING METHOD

Area - A method in which the wastes are spread and compacted on the surface of the ground and cover material is spread and compacted over them.

Quarry - A variation of the area method in which the wastes are spread and compacted in a depression; cover material is generally obtained elsewhere.

Ramp - Another variation of the area method in which a cover material is obtained by excavating in front of the working face. A variation of this method is known as the progressive slope sanitary landfilling method.

Trench - A method in which the waste is spread and compacted in a trench. The excavated spoil is spread and compacted over the waste to form the basic cell structure.

Wet Area - A method used in a swampy area where precautions are taken to avoid water pollution before proceeding with the area landfill technique.

SANITATION - The control of all the factors in man's physical environment that exercise or can exercise a deleterious effect on his physical development, health, and survival.

SATELLITE VEHICLE - A small collection vehicle that transfers its loads into a larger vehicle operating in conjunction with it.

SCREEN

Rotary - An inclined, meshed cylinder that rotates on its axis and screens material placed in its upper end.

Vibrating - An inclined screen that is vibrated mechanically and screens material placed on it.

SECATOR - A separating device that throws mixed material onto a rotating shaft; heavy and resilient materials bounce off one side of the shaft, while light and inelastic materials land on the other and are cast in the opposite direction.

SECONDARY MATERIAL - A material that is utilized in place of a primary or raw material in manufacturing a product.

SEEPAGE - Movement of water or gas through soil without forming definite channels.

SEPARATION - The systematic division of solid waste into designated categories.

SEPARATOR

Ballistic - A device that drops mixed materials having different physical characteristics onto a high-speed rotary impeller; they are hurled off at different velocities and land in separate collecting bins.

Inertial - A material separation device that relies on ballistic or gravity separation of materials having different physical characteristics.

Magnetic - Any device that removes ferrous metals by means of magnets.

SHEAR SHREDDER - A size reduction machine that cuts material between two large blades or between a blade and a stationary edge.

SHREDDER - A machine that reduces discarded automobiles and other low-grade sheet and coated metal in a continuous operation to fist-size pieces.

SLAG - A mineral substance formed by chemical action and fusion at furnace operating temperatures.

SMOKE - An aerosol consisting of all the dispersible particulates produced by the incomplete combustion of carbonaceous materials entrained in flue gas.

SOLID WASTE - Useless, unwanted, or discarded material with insufficient liquid content to be free flowing. *See also* WASTE.

Agricultural - The solid waste that results from the rearing and slaughtering of animals and the processing of animal products and orchard and field crops.

Commercial - Solid waste generated by stores, offices and other activites that do not actually turn out a product.

Industrial - Solid waste that results from industrial processes and manufacturing.

Institutional - Solid wastes originating from educational, health care, and research facilities.

Municipal - Normally, residential and commercial solid waste generated within a community.

Pesticide - The residue resulting from the manufacturing, handling, or use of chemicals for killing plant and animal pests.

Residential - All solid waste that normally originates in a residential environment. Sometimes called domestic solid waste.

SOLID WASTE MANAGEMENT - The purposeful, systematic control of the generation, storage, collection, transport, separation, processing, recycling, recovery, and disposal of solid wastes.

STACK - A vertical passage through which products of combustion are conducted to the atmosphere.

STORAGE - The interim containment of solid waste, in an approved manner, after generation and prior to ultimate disposal.

SULFUR OXIDES (SO_n) - Compounds of sulfur combined with oxygen that have a significant influence on air pollution.

TRANSFER STATION - A site at which solid waste is concentrated and then taken to a processing facility or sanitary landfill.

TRANSPORT - The movement of solid waste subsequent to collection.

WASTE *See also* **SOLID WASTE.**

Bulky Waste - Items whose large size precludes or complicates their handling by normal collection, processing, or disposal methods.

Construction and Demolition Waste - Building materials and rubble resulting from construction, remodeling, repair, and demolition operations.

Hazardous Waste - Those wastes that require special handling to avoid illness or injury to persons or damage to property.

Wood Pulp Waste - Those wastes that require special handling to avoid illness or injury to persons or damage to property.

Special Waste - Those wastes that require extraordinary management.

Yard Was. - Plant clippings, prunings, and other discarded material from yards and gardens. Also known as yard rubbish.

WASTE PROCESSING - An operation such as shredding, compaction, composting, and incineration, in which the physical or chemical properties of wastes are changed.

WET MILLING - The mechanical size reduction of solid wastes that have been wetted to soften the paper and cardboard constituents.

APPENDIX H
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MATERIAL NUMBER	CATEGORY/ NAME	COMMON NAME (FORM)	FACT SHEET PAGE NUMBER
93	COTTON	COTTON (CLOTH)	III-93
94	COTTON	COTTON (CLOTH)	III-94
95	COTTON	COTTON (CLOTH)	III-95
96	FELT	FELT (SHEET)	III-96
97	JUTE	BURLAP (CLOTH)	III-97
98	SCRIM/FOIL LAMINATION	POLYOLEFIN/ ALUMINUM/SCRIM (SHEET)	III-98
	WOODS		
99	WOOD	COOPERAGE (BOARD)	III-99
100	WOOD	EXCELSIOR (SHREDS)	III-100
101	WOOD	PLYWOOD (SHEET)	III-101
102	WOOD	VENEER (SHEET)	III-102
103	WOOD	WOOD (BOARD)	III-103
104	WOOD/ METAL	NAILED OR WIREBOUND (BOARD)	III-104